Micro- and Macrocosm: The Human Body and the Natural Environment in Archaic and Classical thought

by

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Declaration

I hereby declare that this thesis is my own work and has not been submitted for a degree at another university. There is an earlier version of the material discussing the link between weather prediction and medical prognosis in "The Use of Prediction in Meteorology and Medicine" published in Exeter's *Postgraduate Journal of Medical Humanities*.

Abstract

This thesis examines the micro-/macrocosm model in Archaic and Classical Greek thought. The main focus of the thesis centres on medical and philosophical theories and these are examined against the background of popular beliefs and mythology. The evidence investigated will be drawn from the Hippocratic and Aristotelian Corpus. The original formation of mankind is studied in relation to the idea that mankind is a product of the natural environment and so parallels the universe in its form and processes. Owing to this, the body reacts in the same way as the natural environment does to change and the overall nature of the natural environment extends to the nature of the body and its diseases. The fact that the body changes with the weather in this way meant that physicians could predict disease patterns through predicting the weather.

Abbreviations

CMG: Corpus Medicorum Graecorum

DK: Diels, H and Kranz, W (1952) *Die Fragmente der Vorsokratiker* Vol.1-3, Berlin: Weidmannsche

EM: Etymologicum Magnum

FGrHist : Die Fragmente der Griechischen Historiker

Hdt.: Herodotus, *Histories*

KRS: Kirk, G.S., Raven, J.E., and Schofield, M. (1983) *The Presocratic Philosophers: a critical history with a selection of texts*, 2nd edition, Cambridge.

L: Littré, E. (1861) (repr. Amsterdam: Hakkert, 1962) *Oeuvres complètes d'Hippocrate*, Paris.

LIMC: *Lexicon iconographicum mythologiae classicae*

LSJ: Liddell-Scott-Jones Greek-English Lexicon

Paus.: Pausanias, *Description of Greece*

PCG : *Poetae Comici Graeci*

Thuc.: Thucydides, *History of the Peloponnesian War*

TrGF: *Tragicorum Graecorum Fragmenta*

Introduction

Summary of the thesis

This thesis is a new exploration of the relationship between mankind and the natural environment in Archaic and Classical Greek thought. It shows how the human body can be situated in the natural environment as part of a micro-/macrocosm model where mankind as microcosm reflects the natural world as macrocosm in both its form and its functions. In Chapter One this thesis will argue for the importance of the idea that the human body was itself a product of the natural environment in ancient thought and was thereby seen by the ancient physicians and philosophers as an integral part of the natural world rather than as a separate entity fundamentally different from it. It will go further than previous studies by showing that the human form is not only penetrated by natural forces that disrupt its form and function but that the form of the body and the processes occurring within it parallel the form and the processes occurring in the natural world according to ancient theories. Chapter Two will explore how the powers[1] manifest in the natural world are projected onto the inner workings of the human body by natural philosophers and physicians and argue that these powers are affecting an entity that is an imitation of the natural world. The body is therefore reacting in the same way to change in the natural world

[1] When physicians and philosophers discuss 'powers' in the natural world and in the human body they are often discussing natural, impersonal powers such as the hot, cold, wet, and dry and the effects these have on the body rather than an effect attributable to divine power. For example, Alcmaeon of Croton is reported by Aetius to have discussed the powers (δυνάμεις) hot, cold, moist, dry, bitter, and sweet 'and the rest' at work in the body, the imbalance of which caused disease: KRS 310. The term δυνάμεις can effectively mean 'power' or 'potential' within a substance to effect change but can also have other meanings such as 'property' or 'force.' *Airs, Waters, Places* refers to the powers of a variety of natural phenomena and the term power can effectively mean 'property' with a potential to cause change. For example, the powers or properties (δυνάμιας) of different waters: *Airs, Waters, Places* 1, l.9-10 Jones = L2.12.6-7. The term δύναμις can also mean 'force' in Aristotle when he refers to the elementary powers earth, fire, air, and water: *Parts of Animals*, II, 1, 646a14. It must be noted that the divine is often not entirely absent from the theories discussed in this thesis but there was a shift away from incorporating anthropomorphic deities into theories about the natural world and human body: *On the Sacred Disease*, 4-5 Jones =L6.358.19-366.4.; Lloyd (1979) 11; Rihll (1999) 420; Kirk, Raven, and Schofield (1983) 75 and note 6 on the same page.

as its surrounding environment. In Chapter Three, I will approach the links between the human body and the natural environment from a new angle by showing how the ancient physicians used their natural environment to map out what disease patterns would occur in which seasons on the basis of the assumption that the change in weather affected both the land and the body in the same way. The modes of gathering information about how certain weather patterns affected disease patterns will be explored in conjunction with how this information was recorded and referred to in order to make a prediction of disease by predicting the weather.

Examining the ancient texts

The main focus of this thesis centres on ancient philosophical and medical views concerning the human body and its relation to the natural world. It will concern itself primarily with medical and philosophical texts that specifically deal with the human body and its relationship to the natural environment. Evidence will be drawn from a range of works but the main texts used will be drawn from the Hippocratic Corpus and the Aristotelian Corpus.

There is a particular emphasis on the Hippocratic treatise *Airs, Waters, Places* throughout the thesis where the effects of different phenomena and different places on the body are investigated in detail. In conjunction with *Airs, Waters, Places* other texts that explore the effects of natural phenomena will be explored such as the parts of the largely dietetic treatise *On Regimen* II that explains the nature of winds and the effects of these winds on the human body as well as *On the Sacred Disease,* which describes how environmental factors such as the change in the winds can cause epileptic fits. Parts of *Aphorisms* and *Humours* that discuss the effects of the weather will also be examined, and the *Epidemics* will be explored in

some detail in relation to their predictive purpose and compared to *Airs, Waters, Places*.

The way the human body was presented as a product or made up of the same materials as its natural environment in Hippocratic texts such as *On Fleshes* and *On Regimen* I will also be explored. Textual fragments attributed to some of the Presocratic philosophers, who stated that the body was composed of the same materials as those that formed the universe, will be used to highlight similar thought patterns occurring in both Hippocratic medicine and Presocratic thought.[2] Other texts that offer similar theories about the form of the physical body in relation to the natural environment such as the Hellenistic work *On Sevens,* which is part of the same thought world and is not dissimilar to earlier Hippocratic texts and Presocratic texts, will also be used.[3]

Gynaecological treatises such as *On Generation, On the Nature of the Child,* and *On the Nature of Women* will be examined in relation to generative processes and the role of women in comparison to the fertile earth. Similarly, texts such as Aristotle's *Generation of Animals* will be used to explore how the vital heat within a male was compared to the heat emanating from the heavenly sphere.

This thesis will take account of several texts in the Aristotelian Corpus that examine natural phenomena such as *Meteorology* and the bodies of animals

[2] Presocratic texts range in date from the Archaic period to the late Classical and are important when exploring the development of thought worlds that deal with the human body and the natural environment since both topics were often treated by Presocratic philosophers.

[3] For a discussion of the content and date of both parts of *On Sevens* see Mansfeld (1971)1-5 and 19-30. For a discussion of how this treatise relates to other Hippocratic works see Mansfeld (1971) 8-15 and Craik (2015) 127-8. For Presocratic parallels found in *On Sevens* see Mansfeld (1971) 19 as well as Roscher (1911) 14 and 54-79 who first noted the parallels between Anaximander's and Anaximenes' world pictures and *On Sevens*. Based on the vocabulary of the treatise (despite the difficulties of the transmission), which contains Ionic forms, technical vocabulary from philosophy and Hellenistic idioms, Mansfeld has argued persuasively that this text must be post classical and cannot have been written any earlier despite the similarity between the theories of early Presocratics and Hippocratic physicians: 32-53 and 212-13. See Chapter One p.36 n.103 for parallels with Preosratic texts.

including the human such as *History of Animals,* as well as those that explore different forms of generation such as *On Generation and Corruption.* Works attributed to Aristotle, which it is generally agreed were not written by Aristotle himself but came later, will be referred to at times in particular the meteorological phenomena discussed in *Problems* since they offer views about the effects of nature on the human body and show the same pattern of thought we find in earlier Classical texts.[4] The *Problems* offers orthodox answers to questions about the human body and the natural environment and so the material there is not new and can be compared to Classical and Archaic texts which ask the same questions. There are close links between the works of the Hippocratic Corpus and the parts of *Problems* that deal with medicine where *Problems* offers explanations about a particular Hippocratic assertion.[5] The authenticity of these works will not be discussed at length and issues with the text such as different recensions will be discussed in the footnotes but the works will be used to demonstrate the ideas that were inherent in Greek thought. The issue of dating these sources will be discussed later in this section.

In order to examine ideas inherent in Archaic and Classical Greek thought comprehensively, this thesis will consider ancient philosophical and medical texts against the background of attitudes and beliefs inherent in Greek culture at this time where similar ideas about certain natural phenomena and their effects on the body can be found. Authors such as Hesiod, Homer, and excerpts from contemporary tragedy will be incorporated into the thesis from time to time and compared with ancient philosophical and medical ideas that reflect popular beliefs. Indeed, it has

[4] For a full list of works see Barnes (1995) xxiii-xxv.
[5] It is possible that *Problems* is a later work composed in the school of Aristotle in the third century BC. See Louis (1991) XXIV for a discussion of the date. The parallels are particularly strong between the *Problems* and *Airs, Waters, Places* as Thomas shows: Thomas (2015) 79-100.

been recognised that ancient tragedians drew on medical knowledge when describing madness or manic behaviour. Also, contemporary theories about the natural environment and about the nature of the universe were drawn on by tragedians. [6]

Some complementary evidence from material objects will be used such as the remains of shrines and religious objects from cult practice. [7] Most evidence of this kind comes from the Athens and the Argolid area since it is the best preserved and most researched area in many cases.

Herodotus will also be used to demonstrate the kinds of ethnographical ideas and theories concerned with climate and weather that were developing regarding different peoples in different environments. Herodotus will be brought in throughout because he has the same commitment to argument by proof or from deduction as Hippocratic physicians and natural philosophers. Indeed, Herodotus often offers his own medical explanations, which have the same commitment to a natural cause as those theories offered by the Hippocratic texts. For example, Herodotus believes that the weather and the change in weather can be blamed for illness and health. He holds that the Egyptians have particularly good health because the seasons do not change much and that change in the climate is the primary cause of disease (Hdt. 2.77.3.)

[6] In this thesis, ancient literature encompasses tragedy, Homeric hymns, Hesiodic poetry, and Homeric epic. For the parallel between symptoms of madness in Euripides' *Heracles* and the symptoms of epilepsy in the Hippocratic work *On the Sacred Disease* see Griffiths (2006) 86 and Bond's commentary: (1981) p.309 notes to lines 930-1009. *Heracles*, 932-4 and *On the Sacred Disease,* 10, l.1-8 Jones=L6.373.4-7. For the various terms used for madness in tragedy and their use in ancient medicine see Padel (1995) 48-54 and for a discussion of the use of 'conventional' imagery for mania drawn from folklore rather than medicine in tragedy see Collinge (1962) 45-8. For medical vocabulary and medical reference in tragedy see Collinge (1962) 43-48 and more recently Craik (2001b) 81-95. For the use of early Greek natural philosophy particularly cosmology and the use of theories attributed to Heraclitus and Empedocles in Aeschylus' *Prometheus Bound* see Irby-Massie (2008) 133-57.

[7] Religious cult covers rites performed to nature deities such as the winds, rains, the nymphs of springs and the gods of rivers.

This view can be compared to Hippocratic treatises such as *Airs, Waters, Places* and *Epidemics* both of which carefully note changes in weather.[8]

Texts from the Archaic and Classical periods present the reader with a series of issues. There are methodological problems with reconstructing attitudes and beliefs in the ancient Greek world at this time. Though beliefs in how the natural environment functions and what powers are manifest there are sometimes written explicitly, often they are only implied in the ancient texts and we rely on inference. However, they should not be ignored since views about the natural environment and the effects on mankind found in the literature mentioned above and in rites performed in religious cult to nature deities have parallels in ancient medical and philosophical thought.

Ancient philosophers and physicians were naturally influenced by the attitudes and beliefs inherent in the culture into which they were born. In our period, attempts are sometimes made to rally against religious views of how disease affects a body. For example, Thucydides famously describes the great plague of Athens in a way that invites comparison with how the Hippocratic physicians described disease through empirical observation, describing the patient and the spread of disease in the body from head to toe and only mentioning the gods to note that both supplication and neglect of the gods made no difference.[9] Again, the author of *On the Sacred Disease* describes a disease that is 'no more divine than any other' and gives natural

[8] See Chapter three especially pp.208-30 for a full discussion of how weather effects and changes disease patterns. For further examples see Thomas (2000) 30-42. See Rosalind Thomas also for the argument that it is implausible to separate Herodotus from the ethnographical ideas put forward in contemporary Hippocratic treatises.Thomas (2000) 28-74.

[9] Thuc. 2.48-54. Page and Craik note that Thucydides' description of the plague and how it affected the patient can be compared to the case studies of patients compiled by Hippocratic authors and that the vocabulary and terminology used in this description has parallels in the Hippocratic Corpus making it clear that Thucydides drew on contemporary medical knowledge. Page (1953) 97-119 and Craik (2001a) 102-8.

causes for the disease's origins.[10] Many theories in medical and philosophical thought about how disease is caused by natural phenomena build on popular ideas and beliefs about how the natural environment works and what effects it has on the body. In this instance I agree with Lloyd who argues that 'although many Greek scientists self-consciously contrast their own investigations with other, especially traditional systems of belief, they nevertheless often remain deeply influenced by such beliefs…' [11] This thesis takes account of popular beliefs to show that philosophers and physicians are rooted in their own age while not losing sight of the fact that ideas about natural phenomena and disease developed and changed in different patterns of thought. The main focus of this thesis will be on the medical and philosophical texts.

It was once held that Greek medicine was part of the sudden shift from 'irrational' to 'rational' thought or from *muthos* to *logos,* where the concept of disease moved from deities attacking the body to an imbalance of natural powers in the body.[12] Medicine then developed into a systematic study based on empirical evidence from where our modern day medicine was ultimately derived.[13] It has long been recognised that such a clear distinction between 'irrational' and 'rational' thought cannot be made and that *muthos* was not a completely 'irrational' sphere of thought.[14] It cannot be denied that there was a shift away from the inclusion of

[10] Hippocrates, *On the Sacred Disease*, 5 Jones= L6.364.9-366.4. It must be noted that the author of *On the Sacred Disease* does not completely deny the divinity of disease here and even offers alternative religious rites to those he thinks are wrong for the treatment of the disease. 4, l.30-42 Jones=L6.362.10-12

[11] Lloyd (1983) 1.

[12] For example, with what Dodds terms the 'enlightenment' of the Greeks came 'regressions' in the form of magic and new religions, Dodds (1951) 180-195.

[13] Van Der Eijk (2005) 1-2.

[14] Morgan notes that until the rise of philosophy there was no mythology since myth was regarded as a form of truth and a medium through which natural phenomena were explained, Morgan (2000) 21. Lloyd argues in multiple works that the 'irrational' was not replaced by 'rational' with the advent of philosophy: see Lloyd 1966, 1979, 1983, 1987. The issue in scholarship now is how myth was used as an explanatory tool rather than whether or not it was an 'irrational' sphere of thought. Scholars such

anthropomorphic gods and their divine powers in theories about the natural world and the human body; and a distinction was certainly drawn between *muthos* and *logos* by the ancients.[15] Moreover, in Greek medicine the word *muthos* does not occur in the Hippocratic texts thus emphasising that these were treatises aimed at a more logical explanation for disease and natural phenomena. That said, ancient medicine was far more influenced by the world of superstition and religion than was previously thought and there was interaction between different genres of literature and overlap in systems of knowledge in the ancient world. The *Oath* is a particularly good example of where ancient medicine and religion overlap since all the gods, beginning with Apollo, are invoked at the beginning of this Hippocratic text reminding us of the invocations found in poetry.[16] Another striking example of where ancient medicine and ancient religion overlap is found in ancient temple medicine where surgery can be found performed and drugs given by the god Asclepius in dreams.[17]

The idea of medicine as a *technē,* which can be defined as any process involving intelligence and practice that translates as 'skill', 'art' or 'craft', is another

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as Buxton and Lloyd have explored the nature of myths and how they were used as an explanatory tool. Lloyd compares 'pre-scientific' theory and practice to that found in natural philosophy emphasising that 'rational' did not replace 'irrational.' He concludes that natural philosophy and medicine deliberately and systematically enquire into matters already apparent in myth (1983) 217. The intelligibility provided by myth is metaphorical 'both in the sense that it is of the nature of metaphor and in the sense that it is qualified intelligibility.' (1987) 4-5. Buxton takes issue with Lloyd's position arguing that the messages in myth are not altogether implicit and working below the surface but they can be explicit in their explanatory function. He states that myths perform a 'paring down' function where they actually 'clarify the data of experience.' Buxton (1994) 207-11. For our purposes, it is enough to say that ideas found in philosophy and medicine about the natural environment and the human body are also found in myth but are expressed differently. Myth is a therefore a system of thought that can be compared to ideas found in philosophy and medicine as a system of thought that offers explanation in a different way.

[15] See p. 1 note 1 above. Isocrates states the difference between *muthos* and *logos* defining both by the form of writing they are associated with; logos was associated with prose whereas *muthos* was associated with poetry. Isocrates, *Evagoras,* 8-11.

[16] Hippocrates, *Oath,* l.1-2.

[17] Edelstein and Edelstein (1998) and see Craik for a basic description of sacred healing. (2015) Xv-xvii. For an example of surgery performed by the god see Edelstein and Edelstein T.423, Stele 1, 12 and Stele 2, 21 and for an example of drugs made up and given to the patient by the god see T.423, Stele 1, 9 and 19.

good example of how *muthos* and *logos* overlap.[18] The Hippocratic physicians argued for their practice as a skill to lend it credibility because their practice was based on extensive observation and systematisation of knowledge.[19] In connection to this, the idea of *technē* was also presented as a method of control over the environment to allow mankind to survive in a hostile world. The stories of Prometheus, the titan who gave the greatest skill (*technē*) of medicine to mankind teaching them how to survive disease,[20] or the story told about Zeus who gave political skill (*technē*) to mankind allowing them to live together, place *technē* in the realms of *muthos.*[21] The stories often told by Sophists such as Protagoras and recorded by philosophers such as Plato (c.433BC) are good examples of how ideas in philosophical and medical thought overlap with ideas in *muthos.* It also shows how ideas can grow simultaneously in both systems of thought and how they interact.

The self-conscious effort to define medicine as a *technē*, exemplified in particular by the treatise *On the Art,* is unique. Medicine defines itself in *On the Art* as a *technē* that is both based on practice and on theory using reason to determine what the physician is facing and how to proceed.[22] The physician also works at a specific site, which is his surgery emphasising medicine's identification with a

[18] LSJ s.v. τέχνη.
[19] See p.10 n. 22 and 24.
[20] Aeschylus, *Prometheus Bound*, 476-483. See Irby-Massie (2008) 133-143 for a discussion of the skills given to man by Prometheus and how the *Prometheus Bound* is a myth about the intellectual development of human kind, particularly the gift of discernment and understanding of the natural world and human body through inquiry, written by an author steeped in the ideas of contemporary natural philosophy. The date of this play is uncertain and dates ranging from 479-430 have been suggested, see Irby-Massie for a full discussion of the date for this work (2008) 137-8.
[21] Plato, *Protagoras*, 322b.
[22] Hippocrates, *On the Art*, 9-12 Jones= L6.16.1-22.14 in particular. For the most recent translation and commentary see Mann (2012). Mann discusses the idea that medicine as a *technē* is based on a certain amount of expertise and a substantial knowledge base see p.179 §9.2 and for the idea that the *technē* of medicine should be applied properly and any failure is not due to the *technē* itself see p.181-2 §9.4. For a defence of the *technē* against the role of chance in curing disease see p.119-21 §4.1 and cf. Schiefsky's discussion of art vs. chance in relation to the treatise *On Ancient Medicine* (2005) 5-13 Jones=L1.580.6-600.6.

technē. Whether a local physician or an itinerant physician working in someone's home, the physician set up a surgery in which to work.[23] The ancient physicians identify themselves with possessing a *technē* rather than associating themselves with philosophers. Some texts in the Hippocratic Corpus attack the philosophers[24] and others defend their medical art as a *technē* even associating their art with a divine origin.[25] Other texts make use of philosophical ideas exploring how the body is made up of particular qualities such as hot, cold, wet, and dry but still define their practice as an art.[26]

Scholars such as Philip Van Der Eijk have carried out extensive work on the intersection between ancient natural philosophy and ancient medicine and it has been shown that there was significant overlap between the two fields.[27] Medical writers were not only aware of the developments in philosophy but contributed to ancient philosophy in both the development of ideas and the development of methodologies and heuristic structures to aid the acquisition of knowledge.

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[23] Advice on how to set up the surgery and how to behave in the surgery with the patient are detailed in the work *On the Surgery.* See Edelstein (1967) 88-91.

[24] *On Ancient Medicine,* 1-2 Jones=L1.570.1-574.7. *On Ancient Medicine* states that those who reduce the body to qualities such as hot, cold, wet and dry in order to show how medicine is a genuine *technē* are wrong to do so since medicine is already an established skill but doctors vary in competence. See Craik (2015) 282 for the idea that this treatise is a defence of medicine against new theories and *Ancient Medicine,* 13, l.1 Jones=L1.598.3 with Jouanna's commentary (1990) 182 n. 3 and 155 n.2 as well as Schiefsky (2005) 111-19 for a discussion of the treatise's polemical nature against philosophical theories and a comparison to other Hippocratic treatises that are polemical or take a similar stance.

[25] For the divine origins of medicine see n. 17 above and n.20 discussing Prometheus teaching medicine to man. For Hippocrates as a descendant of Asclepius or a member of the Asclepiads see Longrigg (1998) 48. *On Ancient Medicine,* 14.3 it is stated that the art of medicine deserved to be ascribed to a god and is commonly believed now. Schiefsky notes in his commentary that this is a clear rejection of the idea that there was a divine or semi-divine benefactor emphasising the accumulation of knowledge over time: p.238 §14.3. Cf. Jouanna's translation (1990) 135 n. 6 which argues for this being a mark of respect to the divine origins of medicine.

[26] *On Ancient Medicine* famously attacks philosophical ideas about reducing the body to qualities such as hot and cold but then reduces the body down to qualities such as bitter and sweet while still defending medicine as an art: *On Ancient Medicine,* 1 and 13-14 Jones=L1.570.1 and 598.3-604.11; *Aphorisms* opens with the statement that the 'art' is long: *Aphorisms,* 1, 1, l.1 Jones = L4.458.1 and discusses the human body in relation to the seasons and their varying characteristics throughout.

[27] Most notably van der Eijk (2005).

Ancient physicians offered theories about disease and change within the body and also concerned themselves with the nature of different natural phenomena and the basic principles on which the universe is based such as natural justice and balance within the natural world. Theories such as these can be compared to those of the ancient philosophers who also discussed natural justice in their theories about the universe and who discuss the origin and nature of natural phenomena.[28] Again, there are some striking similarities between the works of natural philosophers and ancient physicians, for example the importance attributed to air in the work *On Breaths* and the work of Anaximenes.[29] The same is true of natural philosophy which cannot be seen in isolation from ancient medicine since it too discussed medical ideas and theories building on ideas about the body and about disease.[30] For example, Plato discusses disease and processes occurring in the body in conjunction with his description of the birth of the universe in the *Timaeus.* Also, the Presocratic philosophers not only tried to fathom from what material everything was made but also posited theories about the emergence of the body from the natural environment.[31]

[28] For ideas of natural justice and balance in the medical works: see *On Nature of Man*, 7 Jones=L6.46.9 for the rotation of humours and *On Regimen* 1, 3 and 5 Jones=L6.472.12-474.7 and 476.12-478.7 for the push and pull of fire and water. These works are likely to be roughly contemporary: see Craik (2015) 212 and 275 who places *On the Nature of Man* at the end of the fifth century and *On Regimen* at the end of the fifth century to the beginning of the fourth. For the date of *On Regimen* see also Joly-Byl who agrees with Craik placing *On Regimen* at the end of the fifth century to the beginning of the fourth (1984) 47 and van der Eijk for the first half of the fourth century (2005) 169. Jouanna places *On the Nature of Man* at the end of the fifth century (1975) 59-61. For the striking similarities between *On Regimen* and *On the Nature of Man* see Jouanna (1975) 52-4.Compare the older theories of Heraclitus on natural justice roughly a century earlier, particularly KRS 226 and discussion (1983) 201-2; the date of Heraclitus it is generally agreed is c.500BC see Diogenes Laertius who puts his birth at 540BC: Diogenes Laetirus, *On the Lives of Eminent Philosophers,* IX, 1 = DK22A1 and see Kirk, Raven, and Schofield (1983) 181-82 who put it at mid sixth century to early fifth century BC.

[29] *On Breaths* and KRS139-141. Ancient physicians borrow the ideas of natural philosophers often without any reference to them by name: Lloyd (1991) 211.

[30] Van der Eijk (2005) 8-9.

[31] See Chapter One pp.54-6.

There is extensive overlap between ancient philosophy and medicine not only in ideas and concepts but also in modes of explanation and heuristic frameworks. For example, the mode of explanation found in both philosophy and medicine that has been given a significant amount of attention in modern scholarship is analogy.[32] In ancient medicine and philosophy, processes within the human body which cannot be seen by physicians and philosophers are compared to natural processes that can be observed occurring.[33] For example, Anaxagoras famously states that the unseen powers at work in the universe can only be observed 'through the phenomena'.[34] The author of *On the Nature of the Child* describes how a foetus growing in a womb derives all of its moisture and nourishment from its mother as plants do from the earth when they are growing.[35] Again, Aristotle explains the saltiness of both the sea and sweat putting both phenomena down to the failure of heat to master the moisture which creates an impure admixture of earthy and watery parts.[36]

Presocratic philosophical texts will also be included in this thesis and they offer special challenges since only fragments of texts remain sometimes quoted but often written by another.[37] It is generally acknowledged that the Presocratic philosophers are all committed to critical inquiry and finding natural causes for phenomena. My thesis does not deny that the Presocratics included magical and supernatural aspects in their works since it is my view that the divine was not

[32] Most notably Lloyd (1966).
[33] Another example which will feature later on in this thesis is Empedocles' use of the image of air and water in a clepsydra to show how he thinks air is breathed in through the skin and enters the blood vessels: DK31B100. See p.127 n.418.
[34] Anaxagoras: DK59B21a and see Brooke Holmes (2010) 3.
[35] Hippocrates, *On the Nature of the Child*, 16, l.1-13 Potter=L.528.17-9.
[36] Aristotle, *Meteorology*, II 3 358a2-21.
[37] The Presocratic philosophers are philosophers who lived and worked before or contemporary with Socrates. No presocratic work survives and we rely on references and quotations from later works. It must be noted that whether a Presocratic philosopher was actually quoted remains negligible. It is highly likely that Thales did not write anything but later Preoscratic philosophers did compose written treatises. Lloyd (1970) 9 n.1 and 10-11. Kirk, Raven, and Schofield (1983) 1; Curd (1996) 1-8; Warren (2007) 1-9.

entirely rejected by them. However, I will focus on the natural causes offered by these philosophers for phenomena in the natural world and the human body and their parallels with medical texts.[38] Often the Presocratic philosophers are trying to find the original material or *archē* of everything and we have it from Alexandrian writers that these early philosophers wrote works entitled simply 'On Nature.'[39] These philosophers offer a useful insight into the development of thought surrounding the emergence of the human body from the natural environment and the relation of the human body to the natural environment.[40] Set against the Presocratic background, the development of both medical and philosophical thought surrounding ideas about the original materials from which both the universe and mankind are made can be further elucidated.

The nature of the texts

The Hippocratic Corpus and the Aristotelian Corpus present problems to the reader in terms of transmission, authorship, and dates. The problems with the Hippocratic Corpus as a whole start with the number of works and which works should be included. There was no 'Hippocratic Corpus' centuries in which these works were produced. Later scholars assembled medical works that had similar aims in explaining illness logically and offering natural causes for diseases without recourse to magic or the gods. Before 200BC a Hippocratic glossary was put together by Bacchius according to Erotian, which presupposes the idea of a collection of works

[38] Gregory (2013) links the Presocratic works to magic, the supernatural, and religion including the micro-/macrocosm theory (2013) 31-2.
[39] McCoy (2013) xi-xiii. Kirk, Raven, and Schofield point out that this title was a standard title given to Presocratic works by Alexandrian writers who lacked definitive evidence. Kirk, Raven, and Schofield (1983) 100-103 with note 1.
[40] Fragments cited will be taken from Diels-Kranz and Kirk, Raven, and Schofield's edition of the Presocratic texts.

by Hippocrates. Erotian himself gives us a list of about forty works in his *Hippocratic Lexicon* in the first century AD.[41] Other titles are mentioned in the main by Galen (129-c.216AD) and also listed by Anonymus Londinensis (second century AD) before eventually sixty two titles are offered in the mediaeval twelfth century manuscript Vaticanus gr.276, which notably does not agree on ordering or number of texts with the other main group of manuscripts represented by the Marcianus gr. 269 compiled in the tenth century.[42] The transmission of some texts is problematic such as *On Sevens,* which is completely extant in two mediaeval Latin translations that are corrupt and only fragments of the Greek text survive.[43] The problems with the transmission of Hippocratic texts will be addressed in the footnotes so as not to detract from the argument.

It has been acknowledged since antiquity that the Hippocratic Corpus was not written by one person. There are opposing views running through the texts and we have little idea about the authorship of most Hippocratic works. Evidence for the historical Hippocrates remains inconclusive and though he may have written some of the Hippocratic texts we do not know which ones and can only guess at some that are contemporary with his lifetime, which is the mid-fifth century to early fourth century BC.[44] Galen attempted to determine which of the texts were actually written by

[41] Erotian, *Hippocratic Lexicon,* 31.10-15 for reference to Bacchius' compilation, It has been suggested that Hippocratic works existed in the fourth century since a number of works were known to Ctesias, Diocles, and Aristotle: see Joly (1983) 32-44 and Mansfeld puts forward the idea that Hippocrates may have been the physician who began to collect medical treatises in order to properly study the art. His collection of books were then handed down to the Alexandrians who attempted to discover which were genuine works by Hippocrates (1983) 61-2. See Lloyd (1991) 207-8 for the argument against the Hellenistic collection of Hippocratic treatises and the works listed by Bacchius being genuine works of Hippocrates. Craik (2015) xxiv.

[42] Potter and Gundert (2006) 7. There are other mediaeval manuscripts listing Hippocratic texts see Potter and Gundert (2006) 7; Craik (2015) xxiv. The Anonymus Londinensis is a dated from the second century AD and offers a report on Hippocratic opinions as well as references to Hippocratic works.

[43] Mansfeld (1971) 2-5.

[44] Craik (2015) xx, Nutton (2013) 53-7.

Hippocrates and wrote a book on the subject, sadly now lost, and Celsus attributed many works to Hippocrates.[45]

Modern scholars have attempted to put forward suggestions for works that could be considered original works of Hippocrates but they do not all agree. Joly suggested that *Epidemics* I and III along with *Fractures* or *Joints* were the only works originally written by Hippocrates. His evidence is based on a report by Galen that Ctesias, a contemporary physician, took issue with the claim that Hippocrates could reset a dislocated thigh bone pointing to the work *On Fractures* or *Joints* and that there are parallels between the places Hippocrates was connected to during his lifetime and the places written about in *Epidemics* I and III. He disagrees strongly with Smith who suggests that *On Regimen* is the only treatise that could be authentic.[46] Mansfeld, in his response to Joly, does not completely deny Smith's suggestion and does not commit to Joly's conclusions.[47] Lloyd remains sceptical that any attempt to differentiate which works are genuine works of the historical Hippocrates and which are not can lead to a definitive conclusion.[48] Attention turned from deciphering which works were genuine and which spurious works of

[45] Lloyd (1991) 195 and Craik (2015) xi. Nutton describes Galen's early life and his training in Alexandria, which explains his scrutiny of the Hippocratic Coprus throughout his career. He also discusses how Galen hero-worshipped Hippocrates forming a picture of a man who does not make mistakes, which in turn influences his quest for an authentic Hippocratic treatises and led to his exclusion of certain treatises on the basis that they were not written well enough. Nutton (2013) 222-7.

[46] Joly (1983) 35-40; Smith (1979) 44-60.

[47] Mansfeld (1983) 58.

[48] Lloyd (1991) 194-223. Lloyd argues that mentions of Hippocrates in other ancient literature, the main texts being Plato's *Phaedrus* 270c, Aristotle's *Politics,* VII, 4 1326a15-6, and Anonymus Londinensis V35-VI42, cannot offer conclusive evidence as to what can be classed as a work by Hippocrates since both method and content ascribed to Hippocrates by these authors cannot be found in the Hippocratic Corpus. In addition, identifying similarity of style and content between the Hippocratic treatises does not prove that certain groups of works with similar content were written by the same author. Lloyd makes it clear that treatises discussing similar themes such as regimen, prognosis, or the basic components of the human body had differing views making it likely that treatises discussing the same subject were written by different authors.

Hippocrates to which works belonged to the school of Cos and which to Cnidus.[49] However, this approach was also largely unsuccessful with little consensus to date.

The works of the Hippocratic Corpus range from the mid to late fifth century BC to the Hellenistic period.[50] However, there is little accuracy to the chronology of the Hippocratic Corpus and in most cases only loose dates can be provided for any given text based on a few references to historical events, contemporary attitudes, and style or language used.[51] It is therefore difficult to align Hippocratic texts with certain philosophers or sophists or even with lines of thought that were occurring and developing during certain periods of time. It has been posited that the whole notion of a 'Hippocratic Corpus' cannot be justified and that perhaps nothing actually survives of Hippocrates' own works with the suggestion that perhaps he was just a very influential figure in the medical field and did not in fact write anything very much like Socrates.[52]

There is one reference to an alternative author of a core text in the works of Aristotle who ascribes the Hippocratic work *On the Nature of Man* to the physician

[49] Joly suggests a number of works that belong to the Coan and Cnidian school in his article, however, he comes to the conclusion that differences between Coan and Cnidian teachings can be exaggerated and often it is only difference in vocabulary that distinguish the two (1983) 39-43. Mansfeld suggests that the Coan school was more 'patient-orientated' than the Cnidian school which was more 'disease-orientated' (1983) 67. Langholf is sceptical that any evidence for affiliations to different schools is conclusive and instead suggests that a historical reconstruction of ancient medicine should be based on the idea that there was a free exchange of knowledge and ideas between medical centres: (1990) 5. Nutton questions an origin on Cos because Cos is not mentioned as much as Cnidus or other Greek towns (2013) 61.

[50] The treatise *Airs, waters, Places* contains views contemporary with attitudes of Greeks following the Persian wars found in literature such as Aeschylus and Aristophanes: see Craik (2015) 10-11, who puts *Airs, Waters, Places* at mid to late fifth century. There are also parallels with Herodotus and his ideas about different peoples and their connection to landscape where environment can determine both the physical body and character see 9, 122, which Craik does not mention. Works such as *On Sevens* are included in the Hippocratic Corpus which contains Hellenistic idioms in its vocabulary giving it a post-classical date: see p.3 n. 3 above. However, Craik does not rule out a date in the fifth century for this text (2015) 128.

[51] Craik (2015) offers a brief suggestion of date for each Hippocratic work she treats but they remain problematic.

[52] Craik (2015) xxii.

Polybus in his *History of Animals.*[53] Other than this scholars have guessed at who might have written these works since the author(s) do not state their names at the beginning of their work as with authors of history such as Herodotus or Thucydides.[54] It has been suggested that some authors may not have been medical men but sophists or philosophers with little interest in therapeutics.[55] Indeed, the text known as the Anonymus Londinensis dating from the second century AD not only shows a considerable amount of medical literature from the fifth and fourth centuries BC but also ascribes certain findings and ideas to doctors including Hippocrates as well as to philosophers who were not primarily medical men.[56]

It is probable that some texts were written by a single author such as *On the Sacred Disease* or *On the Art*, which are coherent, unified treatises and others were written by multiple authors such as *Epidemics* II, IV, VI, and VII which are more like lists of nosological phenomena or case notes for disease.[57] It has been suggested that many Hippocratic treatises were added to by many hands and that they take on the form of practical handbooks re-worked and updated over time.[58] As a result of this there is the question of whether the word 'author' can be used in relation to the Hippocratic texts.[59] Often the term redactor is more appropriate but I will refer to the person(s) compiling these texts as 'Hippocratic physicians' for the sake of simplicity.[60]

[53] Aristotle, *History of Animals*, III 3 512b11-513a8.
[54] Van der Eijk (2005) 23. Hdt. 1, 1 and Thuc. 1,1.
[55] Van der Eijk (2005) 18-19.
[56] Craik (2015) xvii, Nutton (2013) 58-9. Anonymus Londinensis will be used at times during this thesis since some ideas present in this papyrus may have been derived from a history of medicine compiled by Meno, a pupil of Aristotle.
[57] Van der Eijk (2005) 34.
[58] Lloyd (1991) 210.
[59] Van der Eijk (2005) 33 and Langholf (1990) 3.
[60] Craik (2015) xxviii. Cf. Langholf (1990) 3.

The fact that Hippocratic works have been preserved in a written form is something that has provoked discussion in modern scholarship.[61] Physicians worked in what has been termed the 'medical marketplace' where they vied for customers against other people offering charms and spells as cures.[62] Others refer to a question posed by an audience and answered by the physician, who is essentially making a pitch for his own theories.[63] Physicians also worked in the surgery with their specific tools relevant to their skill. These practices did not necessarily require a written form. Indeed, Plato in his *Phaedrus* states that one cannot learn the medical craft from books.[64] Yet, some treatises have certain characteristics of orality and speech written for oral persuasion such as *On the Art,* which is a rhetorical treatise aimed at defending medicine as an art[65] and some treatises are written specifically on the surgery outlining methods of surgical practice.[66] Indeed, these treatises were composed when writing and literacy were becoming more and more widespread in the Greek world with the composition of histories, plays, laws as well as the writing of lists and the increase in graffiti.[67]

Lonie in his article on literacy and the development of Hippocratic medicine suggests that these treatises may have been written for the better organisation of ideas, the development of ideas, communication with others, and for future

[61] Most notably Lonie (1983) 145-61.
[62] See van der Eijk (2005); See Sassi for a discussion of Hippocratic medicine as a *technē* reacting to forms of prediction and miracles performed by other doctors and charlatans (2001) 141-44.
[63] For example *On Ancient Medicine*.
[64] Plato, *Phaed.* 268a-269a. Lonie suggests that Plato is reacting to the rise of literature in ancient thought and practice (1983) 146-7.
[65] For a discussion of the various characteristics of orality present in this treatise see Jouanna (1988) 167-173.
[66] *On the Surgery, On Head Wounds, On Fractures,* 1, l.12-24 states he must write this treatise in order to stop other physicians making mistakes.
[67] For the earliest uses of writing in the Greek world and a discussion of the use of writing for the state see Thomas (1992) 52-73 and 128-57.

reference.[68] In his attempt to explore how writing caused a change in medicine from the non-literate medical skill described in the Homeric texts to the literate physician making lists and case notes about disease and patients, Lonie investigates how writing is a heuristic tool. He explores the way writing became a means of clarifying material and a way of communicating material to others as well as a useful method of building on pre-existing knowledge.[69]

Lonie notes that case notes such as those found in the *Epidemics*, which are most probably personal notes made by the physician, record 'what is interesting, relevant, or what may turn out to be useful', emphasising the idea that these treatises were written to aid discovery.[70] Philip van der Eijk has suggested that writing this type of information down in a culture where oral teaching and story-telling was still widespread indicates a desire to prevent information being forgotten and a desire to draw from it in the future.[71] This would confirm the idea that many treatises were written for practical use as handbooks perhaps by many authors who were more concerned with the preservation of knowledge and the accumulation of knowledge to aid discovery than with authorship.[72]

For the purposes of this thesis, this is particularly relevant to the study of the *katastaseis* in the *Epidemics* where nosological phenomena are listed under a description of meteorological phenomena for specific years. These compilations of data are the lists of phenomena, both nosological and meteorological, which are used to build up a picture of how weather and disease correlate. Like a handbook, it is

[68] Lonie (1983) 145-61. For a further discussion of writing causing a more analytical and logical mentality as well as being an agent of change in ancient Greece see Thomas (1992) 16-28.
[69] Lonie (1983) 157-61.
[70] Lonie (1983) 155.
[71] Van der Eijk (2005) 38. See Thomas for a discussion of literacy versus orality and the implications of each on memory in society, Thomas (1992) 27-8.
[72] Lloyd (1991) 210.

there to be referred back to and used to keep a record of information. I argue in Chapter Three that weather patterns and disease patterns were observed and recorded for future reference to predict disease through predicting the weather. Indeed, it is possible that physicians drew from written bodies of data when observing the movements of the stars and it is not impossible to imagine physicians drawing from information recorded about disease patterns in conjunction with star phases and weather patterns.[73]

To return to the form of the Hippocratic texts, some are well-compiled treatises that are sometimes polemical, some are aphoristic collections, lists of nosological phenomena, or case notes. Some are well-formed and others lack cohesion or have large chunks missing.[74] Despite this, there are often similarities between texts in terms of information and theories where some texts refer or react to ideas expounded by other texts.[75] For example, some texts have exactly the same wording as each other when referring to the effects of certain phenomena.[76] This, in my opinion, shows knowledge of other texts by some authors or the existence of

[73] In *Epidemics* 6.8.7 a writing tablet is referred to suggesting an existing written collection of information. Van der Eijk (2005) 38.

[74] For a full layout of how the Hippocratic texts are separated from each other and placed into groups by modern scholarship see Potter and Gundert (2006) 7. Two good examples are *On the Nature of Man* and *Airs, Waters, Places.* The first part of *On the Nature of Man* (chapters 1-8 in the Loeb edition and in Littré 6.32.1-52.3) is a unified discussion of the composition of man whereas the latter chapters are many different subjects that do not connect. See Jouanna for a discussion of the two parts of this treatise where it cound be argued that chapter 8 is in fact a conclusion to a separate treatise (1975) 19-38. *Airs, Waters, Places* is in two halves (the first half stops at chapter 12 in the Loeb edition and in Littré at 2.52.10 ; from chapter 1 to 11 there is a discussion of the effects of natural phenomena and particular aspects of cities, from chapter 12-24 there is a discussion of particular lands and their inhabitants and how those inhabitants are shaped by their climate, laws and natural environment) and there is uncertainty as to whether they are by the same author. Lloyd (1991) 209.

[75] It must be noted that despite similarities between texts, common authorship of texts cannot be proven: see Lloyd (1991) 208-19. For evidence of reactions to other texts found in the Hippocratic Corpus: *On Ancient Medicine* is in part a polemic against those who refer to elements such as air, water, earth and fire to explain the workings of the human body. *Aphorisms*, I, 3-11 Jones=L4.458.11-464.14 states that the perfect physical state maintained by athletes is 'treacherous' and other extreme regimens can be particularly unhealthy. The theories referred to are possibly similar to the theories put forward by the author of *On Regimen*.

[76] There are phrases found in *Aphorisms* and *Humours* with exactly the same wording, for example, c.f. *Aphorisms*, III, 5, l.4-7 Jones=L4.486.10-488.12 and *Humours*, 14, l.4-7 Jones=L5.496.3-6.

some form of weather lore where there are well known sayings copied down into these texts but this will not be discussed in detail in this thesis.

Despite its problems, the term 'Hippocratic Corpus' will be used throughout this thesis because the texts incorporated all have the same aim in that they attempt to offer logical, natural explanations for disease even if aspects of cultural beliefs or religion are still incorporated.[77] As for groupings of the texts within the Corpus, there is little point in attempting to arrange them by date or by authenticity and it is often preferable to group them by subject.[78] This is useful when treating the entire Corpus but when treating a specific area of ideas as this thesis does a grouping together of texts into a 'natural environment' category risks leaving out certain parts of texts that deal with the environment because they are classed as dietary or surgical texts rather than philosophical or scientific. It also risks playing down the main thrust of some texts which are not in the main to do with nature. The texts used from the Corpus in this thesis offer similar views concerning the natural environment and the effects it has on the human body and will be drawn from what modern scholars class as those primarily concerned with the natural world as well as diet-orientated texts, therapeutic texts, case notes, gynaecological works and texts dealing with medicine as an art or skill.

The quotations used from the Hippocratic Corpus will be in the main taken from the more modern Loeb editions, the Corpus Medicorum Graecorum, and the Budé editions of texts and cross-referenced in most cases to the Littré text. The Budé editions will also be consulted for in-depth discussion and to refine the English

[77] For example, Hippocrates, *On the Sacred Disease,* 4, l.46-61 Jones=L.6.362.15-364.8.
[78] The most recent example of this is Elizabeth Craik's work on the Hippocratic Corpus which offers a system of categorisation by subject. In the main body of the text, however, the works are listed in alphabetical order for the sake of simplicity and to avoid 'prejudgement and arbitrariness.' (2015) xxvi-vii.

translations. Other more recent editions of texts will be consulted in some cases and the recent commentaries on the main texts such as those compiled by Jouanna will be consulted. Specific terms will be examined using resources such as the *Index Hippocraticus* and Erotian's *Hippocratic Lexicon* to highlight the significance and difference in interpretation of some Greek terminology used in the Hippocratic Corpus.

In an attempt to fathom the effects of natural phenomena on the body in the thought of this period, the texts of the Hippocratic Corpus will be compared to texts from the Aristotelian Corpus noted above. Aristotle's work is probably later than most of the texts I am using but he is an important source for ideas about the natural environment in the ancient world as well as how those ideas developed. He not only offers his own views but he builds on the views of others sometimes quoting the works of the Hippocratic Corpus as well as other older philosophers and physicians such as the Presocratic philosophers. Often, his theories about the natural environment and the human body are similar if not identical to those in the Hippocratic Corpus and his works can be clarified to a greater extent when placed against the background of medical works such as the Hippocratic Corpus.[79] By comparing the Hippocratic texts to Aristotle it is possible to see how theories about natural phenomena and the workings of the human body may have developed in the Aristotelian corpus. It can also aid the investigation into Hippocratic theories which in some cases are roughly contemporary with Aristotle. Indeed, Aristotle often enters into more detail than the Hippocratic physicians when explaining the functioning of the universe and of the human body. Whether this is Aristotle's own development of Hippocratic theories or whether it is further explanation of them is uncertain but

[79] Van der Eijk (2005) 8.

nevertheless relevant to study of ancient ideas concerning the natural environment and the human body.

A version of the Aristotelian Corpus is listed in Diogenes Laertius[80] but Aristotle's works were probably originally put together by Andronicus and it is from Andronicus' catalogue that the Bekker edition derives its ordering.[81] The Bekker pages will be used to denote which passages of Aristotle are used and quoted for the sake of simplicity since most translations of the Aristotelian Corpus refer to the Bekker pages. The translation used will be that which was edited by Barnes unless otherwise stated, the Greek from standard editions such as that from Oxford Classical texts and the Budé editions will be referred to in order to properly analyse the terms used and other translations used to compare where clarification is needed.

Key modern scholarship

In terms of modern scholarship on this subject there have been few scholarly discussions of the micro-/macrocosm model in relation to mankind and the natural environment and, surprisingly, the micro-/macrocosm is rarely taken into account when scholars explore how the natural environment affects the human body. This part will examine the key modern responses to the relationship between mankind and the environment in ancient texts and show how this thesis is original in its attempt to incorporate ideas about the micro-/macrocosm.

I argue that the human body is an integral part of its natural environment in ancient thought to an extent that has not previously been recognised in modern scholarship. It has only been very recently that scholars have started to ask how the

[80] Diogenes Laertius, *Lives of the Philosophers,* V 22-27; Barnes (1995) 7-11.
[81] Barnes (1995) 10.

human body is affected by its natural environment and how it fits into the natural environment as a physical entity in ideas and concepts expounded in literature, art and material culture. The most useful discussions are by Holmes, Lloyd, Sassi, and Langholf. The work carried out by Brooke Holmes on the emergence of the human body as a 'conceptual entity' in the Archaic and Classical periods has been influential in my work. By 'conceptual entity' Holmes is referring to how the body is seen by the ancients from the Archaic period through to the fifth and fourth centuries and the enquiry into nature carried out by natural philosophers and physicians of this period when the enquiry into nature changed the boundaries of how the ancients saw the self. She studies how the human body emerged in the thought of the ancient Greeks and how their view of the body changed with the rise of philosophy and medicine. [82] For the purposes of this thesis, Holmes' explaination of how the hidden insides of the body were imagined by studying the natural world and comparing it to the functions of the body will be my main focus. She suggests that the physical body 'first takes shape as part of a process through which sixth- and fifth- century physicists were rethinking the unseen world and the relationships of power behind phenomenal states and events'.[83] Holmes states that the ancient philosophers and physicians began to see the human body as an entity that was under the influence of natural, impersonal powers rather than anthropomorphic deities and that the phenomena occurring in the natural world could be compared to the phenomena occurring within the human body which manifested as symptoms. This recognition of the human body as an integral part of the enquiry into nature, where the whole conception of what the body is and how the comparison with the natural world helps one 'see' inside the body and learn about how it functions, is a precondition for this

[82] Particularly Holmes (2010) 84-120.
[83] Holmes (2010) 23.

thesis' investigation into the micro-/macrocosm theory where the human body reflects the natural world.[84]

The micro-/macrocosm model is touched on in her chapter on the enquiry into nature focusing on 'natural justice' in the macrocosm and the mirrored balance of powers within the microcosmic human body. She discusses how the powers in the universe shift from personal, social, and even political powers in the form of the Olympian gods to impersonal, physical powers with the emergence of the inquiry into nature and in this enquiry how the microcosm is to be reconciled with the macrocosm by becoming a physical compound.[85] My thesis goes beyond this arguing that the body as a physical compound and as a product of the natural world has the same composition as the natural world and shows the same processes of change as the natural world. I explore how the human body as a physical being reflects the macrocosm not just in the powers at play in the universe but also in how processes such as coction, separation of fluids, and silting occur in both the natural world and the human body. This thesis takes the notion of how the human body is affected and how it fits into its natural environment further by not only discussing how disease is born in the body as a result of the environment but how other processes such as growth and old age reflect the environment.

Holmes also examines how the powers in the natural world affect the human body and how they can be 'seen' when they are displayed through the symptom. She argues that symptoms displayed on the body and natural phenomena taking place in the natural world are manifestations of the same powers. I argue that the powers in the natural world affect the human body and natural environment in comparable

[84] See P.12 note 34 citing Anaxagoras above. For a discussion of the macranthropos idea and how the natural world reflects the body see LeBlay (2005) 251-271.
[85] Holmes (2010) 96-101.

ways but this is because the human body is an imitation of the natural world in both its form and function *because* it is a product of the natural world. Change in the natural environment has the same impact on parts of the body as it does on natural phenomena because the body is not physically dissimilar to the natural world. What composes the human body is the same as the components of the universe. The bones and skin are described as earthy, the blood contains water and air, the life force is warm or like fire. It is not a direct replica but it is an imitation of the whole. The forces at work within the body are the same as the forces at work in the universe and its physical make up is similar to the natural world because it is made up of a mix of all the components of the natural world. This makes the body a microcosm of the universe which is the macrocosm because it is composed of the same materials.

If the human body is integrated into the natural environment to such an extent then where does this lead us in terms of the effects of change on the body? There has been extensive scholarship carried out on the effects of the opposites such as of the hot, the cold, the wet, and the dry on the human body, which brings in the effects of natural phenomena such as winds and the seasons as well as diet and therapeutics.[86] Both Lloyd and Jouanna have examined the complexities of air in the natural world and breath in the human body where air or breath is breathed through the nose, mouth, and skin and plays an important part in bodily processes as well as in the spread of disease.[87] Frixione in his work on the interplay between fire in the natural world and heat and breath in the human body shows how there are not only parallels between powers in the natural world and those in the human body but there is

[86] The most notable being Lloyd (1961).
[87] Lloyd (2007); Jouanna (2012) 121-137.

interplay between powers in the body and in the natural world that explain processes such as respiration and body temperature.[88]

I examine the effects of the natural environment from a different angle by examining the porosity of the human body and the degree to which it is open to the powers of the natural world. Heat, cold, different airs, and waters meet the skin and penetrate the body through its boundary. The skin breathes allowing entrance to the inner body but also covers the innards and holds the body together. Different powers not only enter the body but they can also be drawn out of the body through the skin. I argue that the body is more porous and susceptible to change in the natural environment than has previously been thought. In fact the body is integrated into the natural environment to such an extent in ancient thought that it changes with the natural environment as the weather changes and reflects the general nature of the climate. To follow the line of thought of Brooke Holmes, the phenomena displayed in the natural environment are reflected in the symptoms displayed on the human body. But this thesis shows how the body changes to imitate the natural world, the changes in weather cause changes in the body which cause disease and the nature of the diseases of the body reflect the nature of the natural environment.

The change in weather, the climates of different places and the differing effects on the human body of different natural environments will be a main theme of this thesis. Sassi in her book *The Science of Man in Ancient Greece* explores the ways in which barbarians are classified and how they were thought to be subjected to excess or lack in their natural environment in comparison to the Greek climate with its perfect balance of hot, cold, wet and dry. She focuses on the perception of human bodies that differ from each other and from the Greek ideal that is the male, Greek

[88] Frixione (2013).

citizen. Her work is concerned with the difference between male and female bodies, the way barbarians are classified and topics covered include physiognomy, medicine and philosophy. The different shapes a human body grows into are also explored in this thesis where the nature of peoples that were held to be different in ancient thought as a result of their natural environment are explored in relation to the effects of the climate.[89] I not only explore different places with different climates and landscapes but also specific natural environments such as mountains and plains examining how ideas about these places found in popular beliefs are paralleled in ancient medicine. Sassi explores the signs of difference on the body, but this thesis goes further in exploring why these peoples are different because of their environment. It not only examines the outer body where signs of difference are displayed but explores the processes occurring within the body that are also occurring in the natural environment showing how and why the body reflects the natural world it lives in.

Liewert addresses this very briefly in her recent book describing how there are echoes of a micro-/macrocosm analogy in other Hippocratic texts such as *Airs, Waters, Places* where there are parallels between the world view and the human being. However, she does not enter into extensive discussion of this parallelism noting briefly how the human body as well as plants and animals are affected by the weather and how the body reflects certain landforms. [90] I not only point out the micro-/macrocosm models that underlie certain Hippocratic treatises but explore these models as a reason why the natural environment has such an effect on the human form and its disease patterns. Moreover, I trace the ideas inherent in the

[89] Sassi (2001).
[90] Liewert (2015) 180-183.

Hippocratic Corpus to cultural-religious attitudes present in the society of the ancient Greeks suggesting possible origins of medical ideas.

This leads us to the relationship between the change in weather and the change in disease. The relationship between weather patterns and disease patterns crops up throughout the Hippocratic texts. An in-depth knowledge of the movements of the stars in conjunction with the change in weather as the seasons change is apparent in treatises such as *Airs, Waters, Places,* and the *Epidemics.* Sassi also covers medical prognosis in her work and discusses how indebted Hippocratic medicine was to divinatory practices and how the Hippocratic physicians separated themselves from these practices by the systematisation and recording of the signs observed on the body. Though the *katastaseis* of the *Epidemics* are brought in, her main focus is the physical body and the signs displayed on it. My thesis shows how the physician's systemisation of signs that are observed and recorded on the body to aid prognosis can be applied to how a physician observes and records the natural environment and how both sets of observations are then brought together. The physician reads the signs in the macrocosm and correlates them to the signs observed on the microcosm. In this way prediction of the weather is carried out along with prediction of disease since the two are inextricably linked.

In the final chapter of her work, Sassi brings together medicine and astrology where mankind searches for answers or confirmation in the stars when attempting to treat disease. The fields of astrology and astronomy were not strictly separated in ancient thought at this time, but this thesis studies how the ancient physicians observed the movements of the stars in relation to the change in weather and so takes a more astronomical (as we would recognise astronomy) standpoint. This thesis shows how physicians examined the appearance of the patient alongside the state of

the natural environment in terms of the weather conditions and the star phases. According to the ancient physicians, the state of the weather determines how the inhabitants' bodies change and what diseases become manifest inside them because the body reflects the natural environment. As a result of this, if the weather can be predicted through observing signs in the environment then diseases can also be predicted.

Sassi is largely sceptical and dismissive of an ancient Greek system of rules for deciphering signs in the stars at this time focusing instead on later Hellenistic compilations of data about the stars. However, it is clear that there was a body of knowledge being recorded mapping out the movements of the stars in association with weather patterns in both the works of poets such as Hesiod and Homer and in the compilations of *parapēgmata*.[91] This thesis explores how physicians also carried out observation of weather patterns in conjunction with star phases and took this practice a step further by applying their findings to disease patterns.

The relationship between disease and the seasons is also explored by Langholf in his work on the *Epidemics* and the methods of research employed in these texts as well as the application of medical theories and their evolution.[92] He argues that the *Epidemics* are written for the purpose of prediction and that the weather of the previous two seasons within a certain *katastasis* or 'constitution' determines which diseases will be suffered in a third season on the island of Thasos. I agree that previous seasons have such an effect on the body as to set it up to suffer more or less in a season where the weather changes. However, I argue that throughout the Hippocratic Corpus the weather has a direct effect on the body and

[91] Sassi (2001) 163. Lehoux's work on the *parapēgmata* is the most extensive work carried out in modern scholarship to date and offers useful insights into the nature of weather prediction in conjunction with star charts Lehoux (2007). See also Taub's chapter (2003) 15-71.
[92] Langholf (1990).

what is important in the composition of the *katastaseis* is the weather in the season in which the diseases are occurring since any change in the weather causes a change in disease.

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This thesis changes our reading of a variety of ancient approaches to how mankind fits into the natural world and how disease is affected by change in the environment. The human body is more than a porous entity affected by the powers running through the natural world.It is a body that is a product of the natural world and reflects the environment it lives in functioning in the same way. The materials that make the body up are the same as those that make up the universe and the processes that occur in the body such as within the blood or in the air we breathe are the same as those that occur in the rivers or on the land as the wind blows through it. This thesis offers a different view of how the body functions within its natural environment as a physical entity formed from the natural world and functioning like a microcosm of its universe. It makes the body an integral part of the natural world rather than a separate albeit porous entity susceptible to the powers manifest in the natural environment. The body changes with the natural environment imitating nature's rhythms in its disease patterns, a relation that was developed by Hippocratic physicians as they attempted to predict these changes in relation to change in the weather.

Chapter 1

Introduction

The term ‘microcosm’ does not occur in the texts this thesis explores but the idea that the human body reflects its universe is expressed by this term. The first explicit reference we have to a man called a microcosm (μικρὸς κόσμος) is found in Democritus towards the end of the fifth century BC.[93] Rather than the term ‘microcosm’ the human body is referred to as an ‘imitation of the whole’ (ἀπομίμησιν τοῦ ὅλου) or such an imitation is implied suggesting that a micro-

[93] DK 68 B34. Wright (1995) 56; Holmes (2010) 99 n.60. For a discussion of Democritus’ date see Kirk, Raven, and Schofield (1983) 404.

/macrocosm model exists where the human body is a miniature copy of the universe.[94]

This chapter studies the different types of micro-/macrocosm models that are found in texts throughout this period and the ways in which they were put forward. The first part of this chapter will explore the Hippocratic treatises *On Regimen* I and *On Sevens*[95] because they offer explicit models where the human body reflects the universe and the universe reflects the human body. Texts where a micro-/macrocosm model is not explicitly put forward but which reflect the the micro-/macrocosm pattern of thought inasmuch as bodily functions parallel natural phenomena will also be examined; the main works used here will be *Airs, Waters, Places* and Aristotle's *Meteorology.* The difference between explanation by analogous processes occurring in the natural world and in the human body and actual parallels between natural phenomena and human bodily functions where identical processes are taking place in the natural world and in the human body will also be explored.

The second part of this chapter will show how the formation of the original race of men was thought to come about by the heavens and the earth mixing together, a process in which heat or moisture from the heavens mixed with the earth to create the human body. Thus, the human body is made from the same substances as the universe making it a microcosm in terms of its materials. Here, the Hippocratic treatises *On Fleshes* and *On Regimen* I will be explored both of which state that the human body is made from the same basic components as those of the universe. [96]

[94] Specifically *On Regimen* 1, 10, l.1-4 Jones= L 6.484.17-19.
[95] The date of this treatise is placed in the Hellenistic era: see p. 3 n.3 and p. 36 n.100.
[96] Date for *On Fleshes* is 450-400BC according to Craik on the basis of expression and associations in content: (2015) 48 and the late fifth to early fourth century is generally given for *On Regimen*: see

The different micro-/macrocosm models that exist between the different sexes will also be examined particularly in relation to the generative roles played by the male and the female where the female is a microcosm of the earth and the male a microcosm of the heavens. Owing to the similarities and the identical roles played between the menstrual fluid of a woman and the earth and the semen of a male and the heat and moisture from the heavenly sphere, it can be argued that the human body continues to exist as a microcosm of the universe through the generative process. The texts used here will be Aristotle's *Meteorology* to explore the nature of the earth and of the heavens and *On Generation of Animals* to compare bodily functions to the earth and heavens. Hippocratic treatises will include *On Fleshes,* which shows how the human body was formed from the heavens and the earth as well as gynaecological works such as *On Barrenness, On the Nature of the Child,* and *On Generation.*[97]

Having explored the ways in which the body reflects the universe, the ways in which disease occurs within the body through imbalance reflecting imbalance in the universe will be investigated briefly in the third part of this chapter. I will also address whether physicians' attempts to re-balance the body reflect this train of thought. The texts used here will be Alcmaeon and the Hippocratic *On the Nature of Man* and *On Regimen* I.

1. The micro-/macrocosm: how the body reflects the universe in its form and in its processes

below for further discussion of the date for *On Regimen,* p.36 and n.102 Both treatises are related by Craik because of their approach to the original formation of mankind with a stress on heat or fire; Craik (2015) 47.

[97] *On Barrenness* is also known as *On Diseases of Women* 3 and dates to the late fifth or early fourth century: Craik (2015) 206. *On the Nature of the Child* and *On Generation* are often treated as the same treatise with *On the Nature of the Child* continuing on from *On Generation.* But for the purposes of simplicity when referring to editions and translations, the separate titles will be kept. They both date to 430-20BC according to Craik: (2015) 118.

It must first be established what the micro-/macrocosm is and what types of models we shall be dealing with. The treatises *On Regimen* I and *On Sevens* will be discussed here since the former offers a micro-/macrocosm model where the body of man is a copy of the universe and the latter a macranthropic model where the universe is a copy of the human body.[98] Next, I shall consider images of the human body in Presocratic, Hippocratic and Aristotelian thought where parts of the body are described metaphorically as parts of the natural world. Finally, I shall consider descriptions of processes in the natural world and in the human body in Aristotle's *Meteorology* and the Hippocratic treatise *Airs, Waters, Places*. These last texts offer two different examples of explanation. In Aristotle's *Meteorology* analogous processes in the human body and the natural world are directly compared and in *Airs, Waters, Places* identical processes that occur in the natural world and in the human body appear in separate accounts of the phenomena in the natural world and the human body.

On Regimen I and *On Sevens*

The two Hippocratic treatises *On Regimen* I and the first part of *On Sevens* explicitly compare the parts of a human body to the parts of the universe. [99] The treatise *On Regimen* is generally dated from the end of the fifth century BC to the first half of the fourth century.[100] On an analysis of its vocabulary, the treatise *On Sevens* should

[98] For a discussion of how the relationship between body and cosmos is the same in these treatises but with a different approach, see LeBlay (2005) 267-8.
[99] *On Sevens* has two parts, the first explains the universe and makes parallels with the human body, the second is a discussion of diseases and the powers hot and cold. The first part of this treatise discusses the universe and all its parts which includes mankind and is dominated by the number seven. It parallels the universe and all living things including man. For the link between the two parts see Mansfeld (1971) 205-29.
[100] See Joly-Byl (1984) 47 and Craik (2015) 275 for the argument for a date c.the end of the fifth century to the beginning of the fourth century BC, van der Eijk for the first half of the fourth century BC (2005) 169 and Bartos (2015) 4 who places the treatise roughly contemporary with Plato.

be placed in the Hellenistic age.[101] Though *On Sevens* is much later in composition, the two texts may be compared because it is recognised that *On Sevens* derives much of its thought from earlier texts and has striking parallels with other texts in the Hippocratic Corpus and with Presocratic ideas.[102]

The treatise *On Regimen* I offers an early micro-/macrocosm model beginning its description of the body thus:

> In a word, all things were arranged in the body, in a fashion comfortable to itself, by fire, an imitation of the whole, the small after the manner of the great and the great after the manner of the small.[103] (Hippocrates, *On Regimen* I, 10, 134.5-6 Joly-Byl= L6.484.17-19)

Fire is the driving force here creating a human body that is an 'imitation of the whole' (ἀπομίμησιν τοῦ ὅλου) and both universe and human body reflect one another.[104] The author goes on to describe how this micro- /macrocosm theory works by drawing parallels between the parts of man and parts of the universe:

> The belly (is made) the greatest organ, a reservoir for dry water and moist, to give to all (the organs) and to take from all. The belly has the power of the sea, which nurses creatures suited to it, destroyer of those not suited. And around it (there is) a concretion of cold water and moist, a passage for cold breath and warm, an imitation of the earth, which alters all things that fall into it. Consuming and developing it dispersed of fine water and of aethereal fire, the invisible and the visible, a secretion from the compacted substance,

[101] See above p.3 n.3.
[102] See Roscher (1911) 14 and 54-79 and Mansfeld (1971) 54-66 for Presocratic parallels. See Mansfeld for the parallels between *On Sevens* and *On Diseases* 3: (1971) 6-16. See LeBlay (2005) 267 and West (1971b) 372 for further parallels.
[103] Ἑνὶ δὲ λόγῳ πάντα διεκοσμήσατο κατὰ τρόπον αὐτὸ ἑωυτῷ τὰ ἐν τῷ σώματι τὸ πῦρ, ἀπομίμησιν τοῦ ὅλου, μικρὰ πρὸς μεγάλα καὶ μεγάλα πρὸς μικρά.
[104] ἀπομίμησιν literally means 'express by imitation' LSJ s.v. ἀπομῑμέομαι.

> in which things are carried and come to light, each according to its allotted portion. And in this fire made for itself three groups of circuits, within and without each bounded by the others: those towards the hollows of the moist, the power of the moon; those towards the outer circumference, towards the solid enclosure, the power of the stars; the middle circuits, bounded both within and without <having the power of the sun>[105] (Hippocrates, *On Regimen* I, 10, 134.7-16 Joly-Byl = L6.484.19-485.7)

This is a difficult and to some extent vague passage to analyse. The physician outlines how man's body reflects not only the earth and the sea but also celestial phenomena such as the moon and the stars. The belly is at the centre and is the home of the body's waters in imitation of the sea in the natural world. Bartos suggests that the belly here refers to all the innards of a human body including stomach, intestines, lungs and heart.[106] In this treatise, the body also reflects the whole in terms of how it works. The author describes how the body reflects the universe as a microcosmic copy in terms of how the different parts function. The belly is a copy of the sea and has the 'po-wer' or 'potential' of the sea (θαλάσσης δύναμιν) suggesting that the belly has the ability to effect what the sea brings about. Thus, the belly imitates both the function performed by the sea and the nature of the sea. Bartos suggests that the

[105] κοιλίην μὲν τὴν μεγίστην, ὕδατι ξηρῷ καὶ ὑγρῷ ταμεῖον, δοῦναι πᾶσι καὶ λαβεῖν παρὰ πάντων, θαλάσσης δύναμιν, ζώων ἐντρόφων τροφὸν, ἀσυμφόρων δὲ φθορόν· περὶ δὲ ταύτην ὕδατος ψυχροῦ καὶ ὑγροῦ σύστασιν· διέξοδον πνεύματος ψυχροῦ καὶ θερμοῦ· ἀπομίμησιν τῆς γῆς, τὰ ἐπεισπίπτοντα πάντα ἀλλοιούσης. Καὶ τὰ <μὲν> ἀναλίσκον τὰ δὲ αὔξον σκέδασιν ὕδατος λεπτοῦ καὶ πυρὸς ἐποιήσατο ἠερίου, ἀφανέος καὶ φανεροῦ, ἀπὸ τοῦ ξυνεστηκότος ἀπόκρισιν, ἐν ᾧ φερόμενα πάντα ἐς τὸ φανερὸν ἀφικνέεται ἕκαστα μοίρῃ πεπρωμένῃ. Ἐν δὲ τούτῳ ἐποιήσατο <τὸ> πῦρ περιόδους τρισσὰς, περαινούσας πρὸς ἀλλήλας καὶ εἴσω καὶ ἔξω· αἱ μὲν πρὸς τὰ κοῖλα τῶν ὑγρῶν, σελήνης δύναμιν, αἱ δὲ [ἐς τὴν ἔξω περιφορήν,] πρὸς τὸν περιέχοντα πάγον, ἄστρων δύναμιν, αἱ δὲ μέσαι καὶ εἴσω καὶ ἔξω περαίνουσαι <ἡλίου δύναμιν ἔχουσι> These final words in brackets were added by Joly and Byl see Joly-Byl 134.16 and 242.

[106] Bartos (2015) 133.

text is referring to the nutritive capacity of both the belly and the sea.[107] This suggestion seems sound since τροφὸν in the neuter can also effectively mean 'that which nourishes' suggesting a nutritive capacity of both the sea and the belly.[108] Also, water is the nourishing agent in this treatise which fits well with the nature of the sea and the belly.[109]

Surrounding the belly is an imitation of the earth. This part is described as a 'concretion' (σύστᾶσις) of cold and moist water as translated by Jones and by Bartos and one assumes it is also solid like the earth.[110] West suggests that this part is referring to the flesh in imitation of the earth.[111] Bartos suggests this is referring to the bones, muscles and skin. [112] Since it is like a 'concretion', there is a suggestion of a formation that is solid but has a moist part which is softer that can be seen as solid bone and softer flesh. The fact that this is in imitation of the earth supports the idea that this part of the system is both moist and solid since the earth was considered a solid but moist entity providing a place upon which everything stands but also being home to waters and softer earth. The passage of hot and cold breath may be a microcosmic reflection of the passage of the seasons or of hot and cold winds. LeBlay links this passage to the seasons but I am more inclined to suggest that this refers to the winds since they are discussed later on in *On Regimen* II.[113] However, the passage is too vague to draw any solid conclusions here.

[107] The word for belly here is κοιλίην which can mean 'cavity' or a space beneath the diaphragm. See Erotian, *Hippocratic Lexicon*, 86, l.23-5. Cf. Aristotle's description of the belly as the place of the sea below: p.47; Bartos (2015) 133-5.
[108] LSJ s.v. τροφός.
[109] Hippocrates, *On Regimen* I, 3, l.8-9 Jones = L6.472.20-22.
[110] Hippocrates, *On Regimen* I, 10, l.4-20 Jones = L6.484.19-485.7.
[111] West (1971b) 378.
[112] Bartos (2015) 133.
[113] LeBlay (2005) 267; Hippocrates, *On Regimen* II, 37-8 Jones = L6.529.1-534.16.

There is then a difficult passage that states that the earth alters everything that falls into it. Bartos maintains that the body alters the nutriment provided by the belly for the physiological needs of the body like the earth that alters all things that fall into it.[114] Indeed, it could be suggested that the earth somehow solidifies the cold and moist water (which it is assumed comes from the belly) into parts such as bones, muscles and flesh. It is moisture and blood that carries the nutrient and causes the body to grow properly according to other medical texts but this system seems to have dispensed with veins and puts forward a process where the nourishment from the sea spreads into the parts around it and is converted by the earth.[115]

The next part of the body described by *On Regimen* I is composed of three circuits forming the outside of the microcosmic human body, which imitates those of the three circuits found on the outer edge of the universe: the circuits of the stars, the 'middle' circuit, and that of the moon.[116] The 'hollows of the moist' are said to have the 'power of the moon'. Indeed, the moon was strongly associated with moisture since it was thought to have a particular effect on moisture and waters.[117] The outer circuit is said to be solid and have the power of the stars. In Presocratic thought, there is sometimes a solid enclosure encompassing the universe to which the stars are attached.[118] Here, West's suggestion that the solid enclosure refers to both the skin and the outer edge of the universe is probably right.[119] In the human body, the skin is not solid but it encloses the body as a system and holds it together similar to

[114] Bartos (2015) 135.
[115] See below for blood and moisture carrying nutrients and causing growth especially pp.99-102.
[116] Lloyd suggests that this middle circuit may correspond to the circle of the planets and West and Joly-Byl suggests that it corresponds to the power of the sun; Lloyd (1966) 252; West (1971b) 378; see quote on p.37 n.105 for addition by Joly-Byl.
[117] See below pp.173-9.
[118] Anaximenes reportedly said that the heavens were 'ice-like' and the stars were fixed to the heavens like nails (KRS 154=Aetius II, 14, 3-4) and revolve like a cap about the head sinking below the horizon and rising again (KRS156=Hippolytus, *Refutation of the Herasies,* I, 7, 6) See Kirk, Raven, and Schofield (1983) 155-6 for further examples and discussion and West (1971a) 103.
[119] West (1971b) 372.

the function of the outer circuit found here. If we take the addition made by Joly and Byl then the middle circuit has the power of the sun and all three heavenly bodies are listed. The circuits of sun, moon, and stars, imitate universes that have a tiered system for the heavenly bodies found in Presocratic theories. In the system put forward by *On Regimen* I the moon is closest to the earth, the sun is above it and the stars are furthest away. This can be compared to Anaxagoras who reportedly held that the stars are far from the earth and the moon is beneath the sun.[120] It is also similar to Anaximander's theory that the stars are closest to the earth followed by the moon and the sun inhabits the top tier of the system.[121] Here, if we are to include the further addition made by Joly-Byl, *On Regimen* I has a three-tiered system for the heavenly bodies strikingly similar to systems found in the world systems of Presocratic philosophers, that he then imprints onto the human body, which also has three circuits at its outer reaches. This similarity between Presocratic theories and that of *On Regimen* I makes it more likely that this addition by Joly-Byl is correct.

In *On Sevens*, we are presented with a more detailed model where parts of the earth are said to mirror parts of the body expounding a 'macranthropic' theory:

> Indeed, the earth is stable and immobile: in the middle of the earth is stony and an imitation of bones, incapable of being affected and immovable by nature; however, that which is around the earth is dissolvable like the flesh of man. That which is warm and wet in the earth is an imitation of the marrow and the brain of man from where the seed descends; however, the water of rivers is an imitation of the veins and blood which is in the veins; swamps, however, are imitations of the bladder and the straight gut; in truth, the seas

[120] KRS 502=DK59A42.
[121] KRS 125= Hippolytus, *Refutation of the Herasies*, I, 6, 4-5. See West (1971a) 85-6.

> are an imitation of the visceral humours of man. Air in fact is the breath which is in man. The moon is the place of perception. [122] (Hippocrates, *On Sevens*, 6= L.8.637 and 9.436)

This treatises offers a fuller description of which parts of the universe are associated with which parts of the body. There are different types of earth, the hard earth imitating the bones and softer earth the flesh. We can compare this to the 'concretion' of cold and moist water found in *On Regimen* I above where the earth is solid and stable but also has a softer part that can be compared to the bones and flesh respectively.[123] Also, the author of *On Fleshes* offers a theory that directly connects the flesh and bones of the human body to the earth when he describes the original formation of mankind describing how bones and other hard parts of the body were formed from the earth solidifying during the original formation of mankind.[124]

Waters in the earth are also separated into different types in *On Sevens* where warm waters resemble the marrow and the seed, rivers the blood and the veins, swamps the bladder and bowels and seas the visceral fluids. Waters are also separated into different types by other Hippocratic physicians who associate the different types with the blood and with fertilisation, life and death, which will be

[122] Terra quidem stabilis et immobilis: media quidem lapidosa <ossium> imitationem habens, impassibilis et immobilis natura; quod autem circa eam est, hominum caro, solubilis. Quod autem in terra calidum humidum, medulla et cerebrum hominis, <unde descendit> semen; aqua autem fluminum imitation est venae et qui in venis est sanguinis; stagna autem vesicae et longao<nis>; maria vero, qui in visceribus est humor[is] hominis. Aer vero spiritus qui est in homine. Luna{e} locus sensus. (Hippocrates, *On Sevens*, 6) West (1971b) 370, my translation. The Greek text has largely been lost and only exists in fragments and so the only complete work we have survives in two mediaeval Latin translations from which this passage in West is derived. For the Ambrosianus G 108 see Littré, E. *Oeuvres completes d'Hippocrate* Vol. IX, 433f. and for the Paisinus lat. 7027 see Littré *ibid*. Vol. VIII, 634ff.; West (1971b) 377; Mansfeld notes that these theories can also be found in the second part of *On Sevens* in chapter 15, which treats the theory of hot and cold in diseases: Mansfeld (1971) 206-7.

[123] *On Sevens* also speaks of an 'undivided concretion' (ἄκριτον πάγος), which is cold like skin that can be compared to the concretion of moisture in *On Regimen* I, 10 see above p.38-9. See West (1971b) 370 n.6.2 and 372; LeBlay (2005) 267.

[124] Hippocrates, *On Fleshes*, 3 =L.8.584.18-588.13.

discussed in Chapter two.[125] Air is in imitation of the breath within a body suggesting that air is not the same within the body as the air outside it. The difference between air and breath is a theme discussed throughout medical thought in our period.[126] The moon is associated with perception, which West suggests is the region of the brain.[127]

The treatise *On Sevens* aims to show how the universe imitates mankind and it is useful to observe this type of model when examining the micro-/macrocosm idea since the comparisons made between human body and universe are the same. Thus, the world could be thought of as a 'macranthropos' just as it can be thought of as the macrocosm that the body of man reflects.[128] The treatise *On Regimen* I states that mankind not only mirrors the universe but the universe mirrors the human body too. Thus, by knowing the body one, potentially, can know the universe and this is a standpoint that many physicians and philosophers take in the texts explored in this thesis.[129]

In both *On Regimen* and *On Sevens*, it is explicitly stated that the physical makeup of the body parallels the physical makeup of the universe. These links between specific body parts and specific natural phenomena can be seen in other medical treatises that explore the relationship between the natural world and the human body that do not explicitly offer a specific micro-/macrocosm model.

Other medical texts: the implied micro-/macrocosm

[125] See pp.97-115.
[126] Often a distinction is made between 'breath' (πνεῦμα) and 'air' (ηήρ) but this is not always the case. For discussion see Chapter Two pp.120-1.
[127] West (1971b) 377.
[128] See LeBlay for further discussion: LeBlay (2005) 256.
[129] LeBlay (2005) 255 for further discussion.

LeBlay states at the beginning of his article on the micro-/macrocosm that ancient physicians borrowed the idea of the micro-/macrocosm from the philosophers which they then developed into a physiological system based on humours and primordial qualities.[130] This can be applied to tretises such as *On Regimen* and *On Sevens* but is too simplistic when applied to other texts that suppose a micro-/macrocosm model. The parallels between the natural environment and the human body in other medical texts can be seen in three different ways: (1) in the terms used to describe the human body (2) analogies made between the natural environment and the human body (3) identical explanations of both phenomena in the natural world and processes in the human body. Though it is important to distinguish between metaphor, analogy, and causation, the common imagery of natural world with human body and the repeated analogies and causes of certain phenomena suggest a deep-seated assumption of ideas of micro-/macrocosm may be found in the thought world of both the physicians and philosophers examined in this thesis.Thus, it is not simply a matter of the physicians borrowing from the philosophers to explain physiology.

Certain descriptions of the body are very revealing when studying the body's similarities to the natural environment. There are persistent images throughout the works discussed that refer to parts of the body as parts of the natural environment or which compare bodily parts to the natural environment that can be compared to the micro-/macrocosm systems described above. For example, the blood is persistently described as different waters or seas. Empedocles says that the heart sits in a 'sea' of blood.[131] The author of *On Breaths* refers to springs (πηγαί) of blood[132] and Plato

[130] LeBlay (2005) 252.
[131] Empedocles: DK31 B105.
[132] Hippocrates, *On Breaths*, 7, l.24-6 Jones = L6.100.10-11.

also uses the word 'spring' (πηγή) of blood to describe the heart[133] as does the author of *On Diseases* IV.[134] This suggests that the blood, like water in the natural world, has a spring from where it flows. As in *On Sevens,* the blood has strong parallels with waters.

Indeed, the blood is affected by different types of water in the natural world, each type of water affecting both the blood and the veins differently.[135] For example, the different texts of the Hippocratic Corpus discuss an earthy part that exists in the veins which can build up if one drinks waters with much sediment in them.[136] Moreover, in the Hippocratic Corpus, an earthy part is not only found in the vessels but is also found in other fluids in the body such as the urine. Indeed, the matter found in fluids such as urine or blood is referred to as 'sand' (ψάμμος) or 'mud' (ἰλύς)[137] For Aristotle, an earthy, fibrous part is considered to be part of the makeup of the blood.[138]

Aristotle also associated specific parts of the body with specific parts of the universe similar to what we find in Hippocratic texts. For example, the skin is analogous with the earth and water:

[133] Plato, *Timaeus,* 70b.
[134] Hippocrates, *Diseases* IV, 2 Potter = L7.542-544 (33). See Index Hippocraticus s.v.πηγή for further examples. Homer always refers to πηγαὶ with a meaning 'streams.' See LSJ s.v. πηγή.
[135] See Chapter Two pp.92-118.
[136] See pp.92-7 for a full discussion.
[137]Hippocrates, *Aphorisms,* IV, 79 Jones= L4.530 (79); *Airs, Waters, Places,* 9, 18-19 Jones = L2.38.7-8; Villard (1992) 468.
[138] Aristotle, *Parts of Animals,* II, 4 650b14- 651a12. See Lennox's commentary for a discussion of how an earthy part is left after evaporation in both the human body and the natural world according to Aristotle: Lennox (2001) 202 650b18.

> For generally speaking, the skin is of an earthy nature; being on the surface of the body it becomes solid and earthy as the moisture evaporates.[139] (Aristotle, *Generation of Animals*, V, 3 782a29-31)[140]

This can be compared to *On Regimen* I, *On Sevens* and *On Fleshes*, all of which associate the earth with the skin or flesh where the earth has a softer, watery part that can be paralleled to the nature of the skin or is made up of the same material as the earth.[141]

Often, comparisons or analogies will be drawn between how natural phenomena occurs in the natural world and how certain processes work in the human body in the ancient texts. At other times, identical processes can be observed in both the natural world and the human body. Though these treatises do not expound a micro-/macrocosm theory as explicitly as *On Regimen* I and *On Sevens*, micro-/macrocosm models are used to explain bodily processes, to explain disease, and to cure.

Aristotle draws analogies between the functioning of the universe and the functioning of the human body. For example, he associates many processes occurring in the natural world with the processes that occur in the human body.[142] In Aristotle's description of how the various phenomena associated with meteorology come about, he associates many meteorological phenomena with how the body works. For example, in the *Meteorology* Aristotle compares the shaking of the earth during an earthquake with the trembling that sometimes occurs in the body of man:

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[139] ὅλως μὲν γὰρ ἡ τοῦ δέρματος φύσις ὑπόκειται γεώδης· ἐπιπολῆς γὰρ οὖσα ἐξατμίζοντος τοῦ ὑγροῦ στερεὰ γίγνεται καὶ γεώδης.

[140] A date for this text is hard to pin-point but it is placed during the time in which Aristotle was head of the Lyceum and was perhaps one of the later works composed around 348-322BC: see Louis (1961) ix-xi. Cf. the translation given by Louis that the skin is like a 'substrat' of the earth.

[141] See above pages: for *On Regimen* I: p.38-9; *On Sevens*: p.41-2; *On Fleshes*: p.42 n.124.

[142] Lloyd (1966) 266-7.

> We must suppose the action of the wind in the earth to be analogous to the tremors and throbbing caused in us by the force of the wind contained in our bodies.[143] (Aristotle, *Meteorology,* II, 8 366b14 -16)

Here, Aristotle is treating the earth as if it were a human body as it works and reacts in the same way as the human body. In Aristotle's view, if one knows how the body works one can deduce how the universe works.

In terms of the micro-/macrocosm, Aristotle draws a similar analogy to the comparison made in *On Regimen* I (cited above) between the sea and the belly when he is discussing the natural place of the sea. In this passage, the belly parallels the nature of the sea in both its form and function and it is worth quoting at length in order to see these parallels clearly:

> The place which we see the sea filling is not its place but that of water. It seems to be the place of the sea because the weight of the salt water gets left behind because it is heavy, while the sweet, drinkable water[144] which is light is carried up. The same[145] thing happens in animal bodies. Here, too the food when it enters the body is sweet, yet the residuum and the dregs of liquid food are found to be bitter and salty. This is because the sweet and drinkable part of it has been drawn away by the natural heat of the body and has passed into the flesh and the other parts of the body according to their several natures. Now just as here it would be wrong for anyone to refuse to call the belly the place of liquid food because that disappears from it soon, and to call

[143] δεῖ γὰρ νοεῖν ὅτι ὥσπερ ἐν τῷ σώματι ἡμῶν καὶ τρόμων καὶ σφυγμῶν αἴτιόν ἐστιν ἡ τοῦ πνεύματος ἐναπολαμβανομένη δύναμις, οὕτω καὶ ἐν τῇ γῇ τὸ πνεῦμα παραπλήσιον ποιεῖν.
[144] Louis translates this as 'potable' water but the literal translation of the Greek shows the comparison between the texts examined better.
[145] καθάπερ can mean 'like' or 'exactly as' LSJ s.v. καθά. Barnes translates it as 'the same' and Lee as 'similar.' It is unlear whether this process is the same or just similar here but the key thing is that it signals an analogy.

> it the place of the residuum because it is seen to remain, so in the case of our present subject.[146] (Aristotle, *Meteorology,* II, 2 355b1-15 [Barnes transl. modified after Lee and Louis])[147]

Here, the belly reflects the sea as it is the place of liquid in the body. It also performs the same function as the sea in that it is the place from where liquid food is taken up into the body and where the residuum is left, just as the sea is one of the places from where water is taken up into the atmosphere and the residual salty part is left. The process of the water cycle is at work here in the body just as it is the natural world and the effect of this process on the liquid in the belly is the same as that on the liquid in the sea. Here, it will be useful to examine Aristotle's explanation of the water cycle:

> Now the earth is at rest but the moisture surrounding it is made to evaporate by the sun's rays and the other heat from above and rises. But when the heat which was raising it leaves it, in part dispersing to the higher region, in part quenched through rising so far into the upper air, then the vapour cools because its heat is gone and because of the place, and condenses again and turns from air into water. And after the water has formed it falls down again

[146] ὃν γὰρ ὁρῶμεν κατέχουσαν τόπον τὴν θάλατταν, οὗτος οὐκ ἔστιν θαλάττης ἀλλὰ μᾶλλον ὕδατος. φαίνεται δὲ θαλάττης, ὅτι τὸ μὲν ἁλμυρὸν ὑπομένει διὰ τὸ βάρος, τὸ δὲ γλυκὺ καὶ πότιμον ἀνάγεται διὰ τὴν κουφότητα, καθάπερ ἐν τοῖς τῶν ζῴων σώμασιν. καὶ γὰρ ἐν τούτοις τῆς τροφῆς εἰσελθούσης γλυκείας ἡ τῆς ὑγρᾶς τροφῆς ὑπόστασις καὶ τὸ περίττωμα φαίνεται πικρὸν ὂν καὶ ἁλμυρόν· τὸ γὰρ γλυκὺ καὶ πότιμον ὑπὸ τῆς ἐμφύτου θερμότητος ἑλκυσθὲν εἰς τὰς σάρκας καὶ τὴν ἄλλην σύνταξιν ἦλθεν τῶν μερῶν, ὡς ἕκαστον πέφυκεν. ὥσπερ οὖν κἀκεῖ ἄτοπον εἴ τις τῆς ποτίμου τροφῆς μὴ νομίζοι τόπον εἶναι τὴν κοιλίαν, ὅτι ταχέως ἀφανίζεται, ἀλλὰ τοῦ περιττώματος, ὅτι τοῦθ' ὁρᾷ ὑπομένον, οὐκ ἂν ὑπολαμβάνοι καλῶς. ὁμοίως δὲ καὶ ἐν τούτοις.

[147] See Louis' commentary for other parts of Aristotle's works that holds a similar theory (1982) 115 notes to p.56.

to the earth.[148] (Aristotle, *Meteorology*, I, 9 346b24-33 [Barnes transl. modified after Lee and Louis])

The heat carries away the sweeter, lighter part of the liquid. In doing so it leaves behind the heavier saltier admixture of water and an 'earthy part.'[149] This process can be seen within the human body where the exhalation from the belly carries nutriment upwards into the rest of the body and leaves behind the 'unwholesome' part.[150] This is explained in *On Sleep* where the two phenomena are paralleled:[151]

> Therefore, as moisture turned into vapour by the sun's heat is, when it has ascended to the upper regions, cooled by the coldness of the latter, and becoming condensed, is carried downwards, and turned into water once more; just so the waste exhalation, when carried up by the heat to the region of the brain, is condensed into phlegm (which explains why catarrhs are seen to proceed from the head); while that exhalation which is nutrient and not unwholesome, becoming condensed, descends and cools the hot.[152] (Aristotle, *On Sleep*, 3 457b30-458a6)

Here, two identical processes, one occurring in the natural world and one in the human body, are compared. Indeed, Aristotle furthers the analogy that the sea is salty just as excrement or sweat is salty in his discussion of the sea:

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[148] μενούσης δὲ τῆς γῆς, τὸ περὶ αὐτὴν ὑγρὸν ὑπὸ τῶν ἀκτίνων καὶ ὑπὸ τῆς ἄλλης τῆς ἄνωθεν θερμότητος ἀτμιδούμενον φέρεται ἄνω· τῆς δὲ θερμότητος ἀπολιπούσης τῆς ἀναγούσης αὐτό, καὶ τῆς μὲν διασκεδαννυμένης πρὸς τὸν ἄνω τόπον, τῆς δὲ καὶ σβεννυμένης διὰ τὸ μετεωρίζεσθαι πορρώτερον εἰς τὸν ὑπὲρ τῆς γῆς ἀέρα, συνίσταται πάλιν ἡ ἀτμὶς ψυχομένη διά τε τὴν ἀπόλειψιν τοῦ θερμοῦ καὶ τὸν τόπον, καὶ γίγνεται ὕδωρ ἐξ ἀέρος· γενόμενον δὲ πάλιν φέρεται πρὸς τὴν γῆν.
[149] Aristotle, *Meteorology*, II, 3 358b35-359a15.
[150] The same analogy can be found in Aristotle, *Parts of Animals*, II, 7 653a1-2. Lennox suggests that these analogies may be based on *Meteorology* I, 9 346b21-36. Lennox (2001) 210 653a2-8.
[151] Taub (2003) 81.
[152] ὥσπερ οὖν τὸ ἀπατμίζον ὑγρὸν ὑπὸ τῆς τοῦ ἡλίου θερμότητος, ὅταν ἔλθῃ εἰς τὸν ἄνω τόπον, διὰ τὴν ψυχρότητα αὐτοῦ καταψύχεται καὶ συστὰν καταφέρεται γενόμενον πάλιν ὕδωρ, οὕτως ἐν τῇ ἀναφορᾷ τοῦ θερμοῦ τῇ πρὸς τὸν ἐγκέφαλον ἡ μὲν περιττωματικὴ ἀναθυμίασις εἰς φλέγμα συνίσταται (διὸ καὶ οἱ κατάρροι φαίνονται γιγνόμενοι ἐκ τῆς κεφαλῆς), ἡ δὲ τρόφιμος καὶ μὴ νοσώδης καταφέρεται συνισταμένη καὶ καταψύχει τὸ θερμόν.

> First, in living bodies what is least digested, the residue of liquid food, is salty and bitter, as we said before. All animal excreta are undigested, but especially that which gathers in the bladder (its extreme lightness indicates this; for everything that is digested is condensed), and also sweat...[153] (Aristotle, *Meteorology*, II, 3 358a6-10 [Barnes transl. modified after Lee and Louis])

Aristotle believed that if one could understand the processes occurring in the natural world then the processes occurring in the human body could also be understood and explained through drawing analogies with the natural world.

It is also possible to observe identical processes occurring in the natural world and in the human body in the Hippocratic Corpus but these descriptions of the human body tend not to be analogies to aid explanation of the human body or the universe as in Aristotle's descriptions. They are descriptions of identical processes in the natural world and in the human body expressed in separate accounts.

For example, the idea we find in Aristotle that the residuum remains in a bodily organ because the lighter sweeter part of the liquid it contains is carried away can also be seen in *Airs, Waters, Places*. In this treatise, there is a description of how the water cycle works in the natural world and a description of how stones are formed within the bladder. Both accounts seem to be describing identical processes but, unlike the last examples quoted from Aristotle where the description of the natural environment is linked to the bodily process in order to serve as an analogy that aids his explanation of the human body, the Hippocratic author does not link the

[153] ἔν τε γὰρ τοῖς σώμασι τὸ ἀπεπτότατον ἁλμυρὸν καὶ πικρόν, ὥσπερ καὶ πρότερον εἴπομεν· ἀπεπτότατον γὰρ τὸ περίττωμα τῆς ὑγρᾶς τροφῆς· τοιαύτη δὲ πᾶσα μὲν ἡ ὑπόστασις, μάλιστα δὲ ἡ εἰς τὴν κύστιν (σημεῖον δ' ὅτι λεπτοτάτη ἐστίν· τὰ δὲ πεττόμενα πάντα συνίστασθαι πέφυκεν)· ἔπειτα ἱδρώς.

two accounts. Instead, there are two separate descriptions in two separate chapters of *Airs, Waters, Places* and they serve two separate purposes. This does not disprove the idea that some Hippocratic physicians believed that the processes at work in the body mirror those in the natural world almost exactly and by understanding the processes occurring in the natural environment, one can apply them to what is occurring in the body. Rather, it shows that, consciously or not, these physicians are describing their natural environment and the human body in the same way.

Thus, in chapter eight of the treatise *Airs, Waters, Places*, the water cycle is described in order to explain why rain waters are good and bad for certain constitutions:

> Rain waters are the lightest, sweetest, finest, and clearest. To begin with, the sun raises and draws up the finest and lightest part of water, as is proved by the formation of salt. The brine owing to its coarseness and weight, is left behind and becomes salt; the finest part, owing to its lightness, is drawn up by the sun...Furthermore, when it has been carried away aloft, and has combined with the atmosphere as it circles round, the turbid, dark part of it separates out, changes and becomes mist and fog while the clearest and lightest part of it remains, and is sweetened as the heat of the sun produces boiling, just as all other things always become sweeter through boiling. [154]

[154] Τὰ μὲν οὖν ὄμβρια κουφότατα καὶ γλυκύτατά ἐστι καὶ λεπτότατα καὶ λαμπρότατα· τήν τε γὰρ ἀρχὴν, ὁ ἥλιος ἀνάγει καὶ ἀναρπάζει τοῦ ὕδατος τό τε λεπτότατον καὶ κουφότατον· δῆλον δὲ οἱ ἅλες ποιέουσιν· τὸ μὲν γὰρ ἁλμυρὸν λείπεται αὐτέου ὑπὸ πάχεος καὶ βάρεος, καὶ γίγνεται ἅλες· …Ἔτι δὲ πρὸς τουτέοισιν, ἐπειδὰν ἁρπασθῇ καὶ μετεωρισθῇ περιφερόμενον καὶ καταμεμιγμένον ἐς τὸν ἠέρα, τὸ μὲν θολερὸν αὐτέου καὶ νυκτοειδὲς ἐκκρίνεται καὶ ἐξίσταται καὶ γίγνεται ἠὴρ καὶ ὀμίχλη· τὸ δὲ λεπτότατον καὶ κουφότατον αὐτέου λείπεται, καὶ γλυκαίνεται ὑπὸ τοῦ ἡλίου καιόμενόν τε καὶ ἑψόμενον· γίγνεται δὲ καὶ τἆλλα πάντα τὰ ἑψόμενα αἰεὶ γλυκέα.

(Hippocrates, *Airs, Waters, Places*, 8, 2.204.11-206.7 Jouanna =L2.32.2-34.18)[155]

Later in the next chapter of the treatise, an explanation for the formation of bladder stones is given:

> But feverishness of the bowels must be accompanied by feverishness of the bladder. For when it is abnormally heated its mouth is inflamed. In this condition it does not expel the urine, but concocts and heats it within itself. The finest part is separated off, and the clearest passes out as urine, while the thickest and most turbid part forms solid matter, which, though at first small, grows in course of time. For as it rolls about in the urine it coalesces with whatever solid matter forms, and so it grows and hardens.[156] (Hippocrates, *Airs, Waters, Places*, 9, 2.209.11-210.5 Jouanna = L2.38.13-21)

Though these descriptions occur in two different chapters and serve two different purposes, when they are compared the process occurring in the natural world and the process occurring in the body is strikingly similar.[157]

Both accounts are describing an identical process but one is occurring in the natural world and the other in the human body. They both describe two stages of a

[155] For how common this theory is in Ionian cosmology see Jouanna (1996) 275 notes to p.205 n.1. Louis points out the comparison between *Meteorology, On Sleep* and *Airs, Waters, Places* in his commentary on *Meteorology* and offers more examples of where this idea can be found within the Aristotelian Corpus: (1982) 28 n. 3. *Meteorology* is most probably written mid-late fourth century BC though book IV does present a problem of authenticity: see Louis' introduction (1982) x-xx; *On Sleep* is probably the later part of the fourth century: see Gallop (1991) 4-6 for a discussion of date; *Airs, Waters, Places* mid to late fifth century: see Craik (2015) 11.

[156] ὁκόσων δὲ ἂν ἡ κοιλίη πυρετώδης ᾖ, ἀνάγκη καὶ τὴν κύστιν τὠυτὸ πάσχειν· ὁκόταν γὰρ θερμανθῇ μᾶλλον τῆς φύσιος, ἐφλέγμηνεν αὐτέης ὁ στόμαχος· ὁκόταν δὲ ταῦτα πάθῃ, τὸ οὖρον οὐκ ἀφίησιν, ἀλλ' ἐν ἑωυτέῳ ξυνέψει καὶ ξυγκαίει. Καὶ τὸ μὲν λεπτότατον αὐτέου ἀποκρίνεται καὶ τὸ καθαρώτατον διιεῖ καὶ ἐξουρέεται, τὸ δὲ παχύτατον καὶ θολωδέστατον ξυστρέφεται καὶ ξυμπήγνυται· τὸ μὲν πρῶτον σμικρὸν, ἔπειτα μεῖζον γίγνεται· κυλινδεύμενον γὰρ ὑπὸ τοῦ οὔρου, ὅ τι ἂν ξυνίστηται παχὺ, ξυναρμόζει πρὸς ἑωυτό· καὶ οὕτως αὔξεταί τε καὶ πωροῦται.

[157] Jouanna points this out in his commentary on *Airs, Waters, Places* but does not expand on its significance in the micro-/macrocosm. (1996) 281 n.1.

process whereby the finer, lighter parts of the relevant liquids are separated from the heavier parts. The first stage is the initial separating out of the 'finest' (λεπτότατον) part of the liquids by heat.[158] In the natural world the heat of the sun draws the lighter and finer part of water into the atmosphere separating it out from the heavier, thicker brine. In the human body, the heat from the mouth of the bladder, brought on by feverishness of the bladder and bowels, separates the finest and clearest part of the urine from the thicker part, which becomes solid matter, just as rain water is separated from the brine in the previous description.

The second stage common to both descriptions is the process whereby matter is separated from the clearer, finer part of the liquids. In the description of the water cycle in the natural world, the author states that once the finer, lighter part has reached the atmosphere it 'circles round' (περιφερόμενον) and this causes the remaining 'turbid, dark part' (τὸ μὲν θολερὸν αὐτοῦ καὶ νυκτοειδές) of the water to be separated out, which then turns into mist and fog. Earlier on in the text, mist is described as something that destroys the clearness of water when it dissolves into it further suggesting that mist is formed from the heavier, more solid parts that are found in water.[159] In the human body, a similar process takes place whereby the solid matter separated out by the heat of the bladder 'rolls around' (κυλινδεύμενον) in the urine and gathers in size as more of the 'thickest and most turbid part' (παχύτατον καὶ θολωδέστατον) is separated out from the finer, clearer part of the urine. [160]

[158] See Jouanna (1996) 281 n.1.
[159] Hippocrates, *Airs, Waters, Places*, 6, l.6-9 Jones = L2.24.13-15.
[160] A further parallel can be drawn with Aristotle's description in *On Sleep* (quoted earlier pp.48-9) of how mist is formed and how catarrhs are formed in the head; just as some waste is carried up to the head which are separated from the finer exhalation to produce catarrhs, so mist is formed in Aristotle's description when water condenses to cloud and part of the water is left over: Aristotle, *Meteorology*, I, 9 346b33-35.

Thus, the process whereby heat draws up the finer, lighter part of liquid, leaving behind the thicker, heavier part occurs in both the natural environment and in the human body according to the author of *Airs, Waters, Places.* Furthermore, once this initial separation has taken place, further separation of the turbid, darker part of the liquid from the clearer, lighter part occurs as the liquid 'circles' or 'rolls around' either in the atmosphere or in the bladder. These two separate accounts describe two identical processes occurring in the human body and in the natural environment reinforcing the argument that the human body works very much like the natural world. The account of the water cycle is not an analogy to aid the author's description of how the body works. Instead, it is a completely separate account describing an identical process to that found in the body.

This comparison drawn between *Airs, Waters, Places* and Aristotle's *Meteorology* shows that there was little change over time in the theories concerning how heat and moisture worked in the natural world and the human body. However, the method of explanation changes where identical processes are found in both the natural world and the human body in the Hippocratic text but in the Aristotelian they are brought together and directly compared through analogy.

Though some are used as analogies and others used as explanations, there are repeated images and comparisons between the natural world and the human body throughout the texts explored in this thesis. It is not unreasonable to suggest that the repeated comparisons to the natural world and metaphorical images show a deep-seated acceptance of a micro-macrocosm system at work between mankind and the universe. There was a long held belief that mankind originated from the same materials that made up the universe in both natural philosophy and medicine. Since

the human body was composed of the same materials as the universe, it is reasonable to suggest that this is a reason why mankind is a microcosm of the universe, which will be discussed next.

2. Mankind made of the same materials as the universe

Some of the earliest theories concerning the formation of mankind are found in the fragments of the early Presocratic philosophers. These philosophers were the so-called 'first' philosophers because they removed anthropomorphic gods from their explanations and posited theories about mankind and the earth based on natural powers and elements.[161] Xenophanes is reported to have said that everything came from earth and water, a mix of two basic substances which created the universe as well as mankind.[162] Here, mankind is made of the same basic substances as the rest of the universe creating a link between the universe and the human body.

Two treatises in the Hippocratic Corpus, *On Regimen* I and *On Fleshes,* explicitly posit the theory that the human body is made of the same natural elements that compose the universe. The treatise *On Regimen* I maintains that both the universe and the human body are composed of fire and water where fire gives movement to all things and water nourishes all things.[163] In *On Fleshes,* the human body is a product of earth manipulated by divine heat as a result of which it becomes gluey and fatty material as it cools and condenses forming different organs, bones, and flesh.[164]

[161] This is not to say that they removed the divine aspect entirely. In fact many did not. For a discussion of this see p.1 n.1 and p. 8-9.
[162] Xenophanes: DK21 B29.
[163] Hippocrates, *On Regimen* I, 3, l.1-11 Jones = L6.472.12-8.
[164] Hippocrates, *On Fleshes,* 3-5 Potter= L8.584-590 (3-5).

The treatise *On Fleshes* expounds an autochthonic theory where the original human body was born from the earth formed from the soil and the heat from the heavens. This occurred when some heat was left in the earth after the heavens separated from the earth to create the universe.[165] The heavenly, divine heat manipulated the earth into the form of the human body and the heat remaining inside the body acted as a life force.[166] Empedocles posited a somewhat similar theory that males and females originated from different parts of the earth. Here, the males emerge from the hotter, southern parts of the earth and the females from the colder, northern parts explaining why males are hotter and females colder in his theories. [167] It should be noted that this heat differentiation between the sexes is provided by the natural environment whereby the northern parts of the earth are colder and the southern warmer due to their proximity to the sun.[168] The closer the earth is to the sun the warmer it is and, according to Empedocles, it can yield a higher form of life. This ties in with Empedocles' theories concerning how sex is determined in the womb which he explained in terms of the heat level of the womb. He held that a higher level of heat present created a more developed form of life.[169] Thus, seed falling in a colder womb produced a girl and seed falling into a warmer womb produced a boy according to his theories. [170] Here, the womb imitates the earth in the original formation of mankind, a theory that will be explored further below.[171]

I suggest that the fact that the human body was thought to be born of the earth or composed of the same elements as the natural environment indicates how

[165] Hippocrates, *On Fleshes,* 2-3 Potter= L8.584-588 (2-3).
[166] Hippocrates, *On Fleshes,* 6 Potter =L8.592-594 (6).
[167] Sassi (2001) 86; Empedocles: DK31A81; see below for the idea that females are colder than males in other works pp.65-66 and n.201
[168] Empedocles A81; In some Hippocratic texts, the sun is closer to the southern parts of the earth than the northern, for example *On Regimen* II, 37, l.3-5 Jones= L6.528.2-4.
[169] Sassi (2001) 86.
[170] Empedocles: DK31 B67.
[171] Pp.66-7.

the micro-/macrocosm theory came about as a development of these theories. The body imitates the universe as a smaller copy of it because it is a product of the universe and because it is composed of the same elements.

It could be argued that the original race of men would imitate the universe as a direct product of it but the generations after do not, since humans reproduce with each other. However, the human body imitates the process of generation that occurs when the heavens mix with the earth. This can be seen in the similarity of a woman's menstrual fluid and womb to the earth and the similarity of a man's semen to the heat and moisture that originates from the heavens.

Different sexes and generation in the micro-/macrocosm

The idea that the male is most associated with the heavenly sphere and the female with the earth is found throughout the texts examined in this thesis. The texts examining the nature of the male will be in the main taken from Aristotle's *On Generation of Animals* and the Hippocratic treatise *On Generation*. Both works show how the semen reflects the heat that emanates from the heavenly sphere and how waters such as rains are carriers of seeds that can engender life and fertilise the earth below. The texts dealing with the earth's resemblance to a vast womb from which all forms of life grow will range from Plato's *Menexenus*, which offers mythological arguments, to Hippocratic treatises and Aristotelian works showing similar theories in the natural philosophy and medicine.

Aristotle represents a micro-/macrocosm model where there is a direct comparison between the female and the earth and the male and the heavens in terms of reproductive roles:

> For by a male animal we mean that which generates in another, and by a female that which generates in itself; that is why after the manner of the whole[172] also, men think of the earth as female and a mother, but address heaven and the sun and other like entities as generators and fathers.[173] (Aristotle, *Generation of Animals,* I, 2 716a13-16 [Barnes transl. modified after Peck])

This section seeks to demonstrate how far the male human body reflects the heavenly sphere primarily in its generative capacity and how far the female reflects the earth in her role as a womb and a mother in this period.

The male body and the heavenly sphere

The male body has a strong association with the heavenly sphere in both its nature and its function. Since the male was generally believed to be hot and dry in opposition to the female,[174] this region was associated with the male in its nature as the drier, warmer region of the universe where the air became thinner and warmer as it reached the realms of the fiery heavenly bodies.[175] The most prominent micro-/macrocosm model that exists between the male and the heavenly sphere lies in the idea of the male as a reflection of the heavenly sphere's generative capacity. This

[172] Barnes translates this as 'macrocosm', Peck in the Loeb as 'in cosmology' and Louis as 'l'universe'. None of these translations are satisfactory and I have kept a literal translation.
[173] ἄρρεν μὲν γὰρ λέγομεν ζῷον τὸ εἰς ἄλλο γεννῶν, θῆλυ δὲ τὸ εἰςαὐτό· διὸ καὶ ἐν τῷ ὅλῳ τὴν τῆς γῆς φύσιν ὡς θῆλυ καὶ μητέρα νομίζουσιν, οὐρανὸν δὲ καὶ ἥλιον ἤ τι τῶν ἄλλων τῶν τοιούτων ὡς γεννῶντας καὶ πατέρας προσαγορεύουσιν.
[174] Hippocrates, *On Regimen* I, 27, l.1-6 Jones = L6.500.1-5; Aristotle in males are hotter and so can concoct the blood into semen: Aristotle, *On the Generation of Animals,* IV, 1 765b8-20. Lloyd (1966) 58-9.
[175] Hippocrates, *On Fleshes,* 2 Potter = L8.584 (2); *On Breaths,* 3, l.21-5 Jones= L6.94.13-17. For Aristotle, the air next to the rotating αἰθήρ was hot and dry since this is where it became fire owing to the friction of the αἰθήρ. Aristotle, *Meteorology* I, 3 340b10-13 and I, 3 341a14-24.

can be seen in the moist and warm nature of the semen which reflects the rain and the rivers as well as the heat that originates in the heavenly sphere.

In terms of heat, there are two forms of heat in the natural world found in ideas about the natural environment at this time: one which could generate and one which could only provide warmth. Indeed, there are two different forms of fire in mythology and it is important to distinguish the two since the same distinction is held by the ancient philosophers and physicians. The fire stolen by Prometheus from Zeus and given to mankind in order to help human beings survive in their hostile environment is very different to the fire of Zeus' thunderbolt. Promethean fire is a non-generative heat which gives warmth whereas lightning is hot and comes directly from the heavens with a generative capacity.[176] This difference is strikingly similar to the difference maintained by the ancient philosophers and physicians who discuss the heat that emanates from the heavenly sphere and that which comes from fire. Heat in the ideas and theories put forward in both myths telling of the origin of man and in the theories of the natural philosophers plays an important role not only in the formation of the body but also in providing the body with a life-force or movement. For example, in *On Fleshes*, it is the divine heat from the heavenly sphere mixed with the earth that initiates the formation of the original race of men from the earth. This heat is present in every human body since it provides the body with a moving force.[177]

The parallels between the generative heat found in the male's semen and that found in the heavenly sphere can be seen most prominently in the theories put

[176] Segal (1982) 149. Segal states that the two fires are different in their nature where the lightning of Zeus is unquenchable, destructive but also generative in the case of Dionysus and the Promethean flame is more domestic and can be mastered by mankind. He does not discuss the generative capacity of Zeus' fire at any length. See Caldwell (1987) 94 for the generative capacity of the sky god.
[177] Hippocrates, *On Fleshes*, 2-3 Potter = L8.584-586 (2-3) and 6 =L8.592-593 (6).

forward by Aristotle. Connell argues that Aristotle's view that the heavens are generators and fathers cannot be reconciled with Aristotle's views on the role played by the sun and earth in generation. She argues that the heat from the heavenly sphere has too much of a varied offspring from the earth to be compared to the heat in animals, which produces particular types of species.[178] I argue that the heat within a human body and that of the heavens can be directly compared in their respective natures since they are similar not only in generative heat but also in their airy component. In short, it does not appear to matter what type of offspring is produced by either type of heat.

According to Aristotle, the same heat is found in the male's semen as that found emanating from the heavenly sphere. This heat is different to regular heat arising in fire where regular fire does not generate living beings whereas heat from the sun does:

> Hence, whereas fire generates no animal and we do not find any living thing forming in either solids or liquids under the influence of fire, the heat of the sun and that of animals does generate them.[179] (Aristotle, *Generation of Animals,* II, 3 737a1-3)

Modern scholars tend to focus on the 'divine' aspect of the αἰθήρ in comparison to the male role and analogy between the nature of the semen and the divine element.[180] However, I suggest that Aristotle is not referring to the αἰθήρ specifically here but to the heat produced by the friction of the thin air against it. The heat from the sun is different in nature to the heat from normal fire found in the terrestrial region because it is heated air close to the αἰθήρ. The αἰθήρ itself is not inherently hot but the

[178] Connell (2016) 128.
[179] διὸ πῦρ μὲν οὐθὲν γεννᾷ ζῷον, οὐδὲ φαίνεται συνιστάμενον ἐν πυρουμένοις οὔτ' ἐν ὑγροῖς οὔτ' ἐν ξηροῖς οὐθέν· ἡ δὲ τοῦ ἡλίου θερμότης καὶ ἡ τῶν ζῴων οὐ μόνον ἡ διὰ τοῦ σπέρματος.
[180] Most recently Connell (2016) 187-192; Solmsen (1957) 119-123.

friction against the air as the αἰθήρ turns produces heat because it ignites the air.[181] For Aristotle, the vital heat present in a human body and the heat produced by the heavenly sphere are one and the same thing. He explains that the heat found in semen is the 'breath' which is equivalent to the 'element of the stars':

> This (the vital heat in semen) is not fire nor any such force, but it is the breath included in the semen and the foam-like and the natural principle in the breath being analogous to the element of the stars.[182] (Aristotle, *Generation of Animals*, II, 3 736b35-737a1 [Barnes transl. modified after Peck])

The stars are formed by the rotation of the αἰθήρ igniting the air hence the 'element of the stars' is not referring to the αἰθήρ, but to the fiery air produced by its rotation.[183] This fiery air found in the heavenly sphere is the same nature as the vital heat or πνεῦμα in Aristotle since it is both warm and breath-like.[184]

A further example of how the male semen reflects generative heat emanating from the heavenly sphere is in the descriptions Aristotle gives for spontaneous generation from the earth. He states that it is the male parent who imparts the heat to a new life but in the case of some animals that are 'spontaneously generated' it is the heat from the natural environment that causes their generation:

> ...it is the nature of the male parent that gives it (heat), or with animals spontaneously generated it is the movement and heat imparted by the right

[181] Aristotle, *Meteorology*, I, 3 340b10-13 and I, 3 341a14-24.
[182] τοῦτο δ' οὐ πῦρ οὐδὲ τοιαύτη δύναμίς ἐστιν ἀλλὰ τὸ ἐμπεριλαμβανόμενον ἐν τῷ σπέρματι καὶ ἐν τῷ ἀφρώδει πνεῦμα καὶ ἡ ἐν τῷ πνεύματι φύσις, ἀνάλογον οὖσα τῷ τῶν ἄστρων στοιχείῳ.
[183] Aristotle, *On the Heavens*, II, 7.289a13-34. And see Peck's edition of *On the Generation of Animals* p.170-1 note e.
[184] For further discussion of the analogous function of πνεῦμα and the heavenly element see Freudenthal (1995) 141-2.

season of the year that is the cause (of generation).[185] (Aristotle, *Generation of Animals,* II, 6 743a33-35)

The nourishment again of some is earth and water, of others a combination of these, so that what the heat in animals produces from their nutriment, the heat of the warm season in the environment puts together and combines by concoction out of the sea-water and the earth. And the portion of the vital principle which is either included along with it or separated off in the air makes an embryo and puts motion into it.[186](Aristotle, *Generation of Animals,* III, 11 762b12-15)

This life-engendering heat emanates from the heavens and causes generation to occur spontaneously, which can be directly compared to the heat in the male body. Thus, the heat from the natural environment emanating from the heavenly sphere and its heavenly bodies causes generation to take place and the male body imitates this in the function of his semen.

Moisture is another important generative substance where the moisture found in the semen reflects the rains and waters in the natural world. Indeed, the semen in the Hippocratic Corpus is sometimes considered to be drawn from all the moisture in the body:

[185] ἐκεῖ δὲ δίδωσιν ἡ φύσις ἡ τοῦ γεννῶντος. τοῖς δὲ αὐτομάτως γιγνομένοις ἡ τῆς ὥρας αἰτία κίνησις καὶ θερμότης.

[186] τροφὴ δ’ ἐστὶ τοῖς μὲν ὕδωρ καὶ γῆ, τοῖς δὲ τὰ ἐκ τούτων, ὥσθ’ ὅπερ ἡ ἐν τοῖς ζῴοις θερμότης ἐκ τῆς τροφῆς ἀπεργάζεται, τοῦθ’ ἡ τῆς ὥρας ἐν τῷ περιέχοντι θερμότης ἐκ θαλάττης καὶ γῆς συγκρίνει πέττουσα καὶ συνίστησιν. τὸ δ’ ἐναπολαμβανόμενον ἢ ἀποκρινόμενον ἐν τῷ πνεύματι τῆς ψυχικῆς ἀρχῆς κύημα ποιεῖ καὶ κίνησιν ἐντίθησιν.

> ...a man's seed comes from all the moisture in his body, and is the excretion of its most powerful part...[187] (Hippocrates, *On Generation,* 1 Potter= L7.470.1-3)
>
> I assert that seed is secreted from the whole body, from the solid parts and the soft parts, and from all its moisture. And there are four kinds of moisture: blood, bile, water and phlegm, for this is the number of kinds of substances a person naturally contains in himself...[188] (Hippocrates, *On Generation,* 3 Potter= L7.474.1-5)[189]

Here, the author states that the seed contains elements of the entire human body and so contains the important elements that are needed to create and to sustain life. This can be associated with the fertilising powers of river and rain water in the natural world since it is both moist and contains the life-generating part needed for fertilisation.

Water, like fire, has its origins in the heavenly sphere when it falls as rain and so has the capacity to be generative. In a fragment from Aeschylus' *Danaids,* Aeschylus offers a fine description of how the rain of heaven fertilises the earth and the impregnated earth yields life.[190] Here Aphrodite speaks:

> The holy Heaven passionately desires to penetrate the Earth,/ And passionate desire takes hold of Earth for union with Heaven./ Rain falls from the brimming fountains of Heaven/ And makes Earth conceive, and she brings

[187] ἡ δὲ γονὴ τοῦ ἀνδρὸς ἔρχεται ἀπὸ παντὸς τοῦ ὑγροῦ τοῦ ἐν τῷ σώματι ἐόντος τὸ ἰσχυρότατον ἀποκριθέν.
[188] Τὴν δὲ γονήν φημι ἀποκρίνεσθαι ἀπὸ παντὸς τοῦ σώματος, καὶ ἀπὸ τῶν στερεῶν καὶ ἀπὸ τῶν μαλθακῶν, καὶ ἀπὸ τοῦ ὑγροῦ παντὸς τοῦ ἐν τῷ σώματι. Εἰσὶ δὲ τέσσαρες ἰδέαι τοῦ ὑγροῦ, αἷμα, χολὴ, ὕδωρ καὶ φλέγμα. Τοσαύτας γὰρ ἰδέας ἔχει ξυμφυέας ὁ ἄνθρωπος ἐν ἑωυτῷ.
[189] Joly translates 'moisture' as 'l'humeur' here. The term ὑγρός is associated with moisture or a fluid of the body. LSJ s.v. ὑγρός. Cf. Hippocrates, *Airs, Waters, Places,* 14, 19-24, Jones =L2.70-92.
[190] Guthrie (1957) 30.

> forth for mortals/ Grazing for their flocks, cereals to sustain their life, /And the fruit of trees: by the wedlock of the rain/ She comes to her fulfilment. Of this, I am in part the cause. (*Danaids,* Frag. 44, ed. Radt)

The rain falling from the Heaven collected in rivers and streams and these natural features were considered masculine deities.[191] There is a particular emphasis on the idea that flowing waters were thought to originate in mountains and were associated with Zeus Ombrios, Zeus god of the rain.[192] In addition, an epithet used for rivers in the *Iliad* was διπετής, 'fallen from Zeus' or 'fallen from heaven' meaning the rivers were fed or swollen by rain.[193] Therefore, waters flowing through the earth were thought to be descended from the heavens and were masculine deities that had the capacity to fertilise and impregnate the earth. The male deity associated with all flowing water was Achelous and local rivers were male in gender.[194] Achelous was a major fertility deity and other local river gods were thought to fertilise the earth and make crops grow. In the same capacity, river gods were prayed to in fertility rites for women about to be married and children were thought to be protected by the river gods until they reached a certain age.[195] Okeanos, the river of Ocean surrounding the edges of the earth is also referred to as the *genesis* (γένεσις) of the gods in Homer suggesting that the waters of the earth can produce life too.[196]

In the micro-/macrocosm, the male was particularly associated with the heavenly sphere from which emanated both heat and moisture both of which were

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[191] Cole (2004) 21-2.
[192] Aristotle, *Meteorology* I,13 350a2-13; Langdon (1976) 79-85; Cook (1925) 897-98.
[193] Guthrie (1957) Chapter 2 note 2; Homer, *Iliad,* 16.174-6.
[194] Cole (2004) 22; Euripides, *Bacchae,* 625; Homer, *Iliad,* 23.141-49.
[195] See Chapter Two pp.102-4.
[196] Homer, *Iliad,* 14.201. Janko discusses the role of Okeanos as a primeval father and notes that it refers to a Theogony where Okeanos and Tethus are the primeval parents who may have been born from Heaven and Earth. This has links to Egyptian mythology where Okeanos may be an equivalent to Apsu, the water deity that begat the Egyptian gods: see Janko (1991) 180-1 notes to book 14 n.200-7.

vital for producing life. The semen in the male was thought to carry both a moist part and/or a warm part, which was associated with the flowing waters of the earth and the heat emanating from the heavenly sphere. What descended from the heavens in the form of heat and moisture and the semen that came from the male were thought to be capable of fertilisation and generation within the earth or a female body, the comparative natures of which will be discussed next.

The female body and the earth

Woman is a microcosm of the earth in her nature as a cold and moist entity and in her role as a mother carrying and sometimes providing the matter for the formation of the baby. In philosophical and medical thought, the female both carries the child providing it with the proper conditions in which it can grow before it is born and provides half of the matter from which it is created sometimes in the form of her menstrual fluid and sometimes in the form of a female seed. Earth plays the same role where she is a womb providing a place in which life was held before it was ready to come into the light and she provides some of the matter from which life was formed in myths about the original formation of mankind.

The nature of the female body can be directly compared to the nature of the terrestrial region. The terrestrial region was considered a colder, moister region in opposition to the warm and dry heavenly sphere.[197] Indeed, the earth is not a mass of dry soil. It is also home to rivers, springs and seas and most of the terrestrial realm,

[197] Hippocrates, *On Fleshes,* 2 Potter = L8.584.13-14; Aristotle, *Meteorology,* I, 2 339a15-20 and for the nature of these elements see *On Generation and Corruption,* II, 3 330b4-5. Aristotle believed that the heavenly sphere was warmer and drier because fire exists in the heavenly sphere next to the αἰθήρ where the air is ignited: Aristotle, *Meteorology,* I, 3 340b10-13 and I, 3 341a14-24 .He also believed that the terrestrial region was cold and moist because it was the place of earth and water, which were both cold elements: Aristotle, *Meteorology,* I, 2 339a15-20.

including the land, some mountains,[198] springs and lakes, is generally the domain of the female.[199] When we examine ancient views concerning the female body, we find that the body of woman was generally thought to be moister and colder than a man's.[200] This moist, cold nature is akin to the moist and cold physical nature of the earth.

We shall now turn to the role played by the earth as a womb and consider what her role is in generation in comparison to the role played by a human female. There are parallels drawn between the anatomy and function of the womb and that of the earth. For example, the Hippocratic author of *On Fleshes* offers a theory concerning the original birth of life forms from the earth. In this theory the earth is perceived as a womb where life grows before it is ready to be born. In the original birth of the human body from the earth membrane-like pods formed on the young earth's surface where life grew until it was fully formed and ready to emerge from the earth. These wombs held life-forms which had been created from the earthy putrefaction brought on by heat from the heavenly sphere.[201]

Where the body of woman is considered a place in which life can grow, the womb was thought by some to provide the right environment for the seed(s) to grow within the menstrual fluid. Indeed, when discussing the role of the womb as a place where conception can take place and where a foetus can be grown, emphasis is placed on the overall condition of the menstrual fluid:

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[198] Helikon is male: LIMC s.v. Helikon; Langdon (2000) 464.
[199] Cole (2004) 22.
[200] For the moistness of women: Hippocrates, *On Regimen* I, 27, l.1-5 Jones =L6.500.1-4; *On the Nature of the Child,* 4 Potter =L7.494.12-3 (15) and women are mentioned along with those with humid constitutions in *Airs, Waters, Places,* 10,l.24-5 Jones = L2.44.6-8; For Aristotle, women are cold creatures which is shown by their inability to concoct blood into semen: Aristotle, *On the Generation of Animals*, IV, 1 765b8-20; King (1998) 10; Lloyd (1966) 58-9; Dean-Jones (1994) 44-6 for the different opinions on the temperature of women in ancient theories and 46 for the moistness of the female body.
[201] Hippocrates, *On Fleshes* 1-3 Potter =L8.584-588 (1-3).

> If a woman's menses cease to flow at all due to all (*sc*. the causes) recorded above, then too she will fail to conceive, since her vessels, being filled with blood, cannot take up the seed, and also old blood must of necessity be present in her uterus which will prevent the seed from being nourished...If more menstrual fluid pass in a woman than should, she will fail to become pregnant too; for her uterus, on being emptied of blood, is too weak to take up the seed...[202] (Hippocrates, *On Barrenness*, 1 Potter=L8.412.11-22)

Here, the menstrual fluid must provide the right conditions within the womb where the child can grow.

The woman was often thought to contribute some of the matter from which a life form is made. Indeed, the menstrual fluid played an important part in generation in these texts. For example, in the both the Hippocratic treatise *On the Nature of the Child* and Aristotle's *Generation of Animals* there is the idea that the menstrual fluid in some way provided the material from which the child is formed:[203]

> The seed is increased by the mother's blood passing down to her uterus; for when a woman is pregnant, her menses no longer flow, if the child is going to be healthy...As blood is drawn in together with breath through the membrane...what is about to form the living being congeals and increases...as

[202] Ἢν δὲ γυναικὶ μὴ χωρέῃ τὰ καταμήνια πάμπαν [ἢ] ὑπὸ πάντων τῶν εἰρημένων, καὶ οὕτως οὐ ξυλλαμβάνει· αἱ γὰρ φλέβες τοῦ αἵματος πλήρεις ἐοῦσαι τὴν γονὴν οὐ δέχονται, καὶ ἐν τῇσι μήτρῃσιν αἵματος ἐνεῖναί τι χρονίου πᾶσα μηχανή, ὅ τι ἀποκωλύει τὴν γονὴν τρέφεσθαι...Καὶ ἢν πλείονα τοῦ δέοντος χωρέῃ τῇ γυναικὶ τὰ καταμήνια, οὐδ' οὕτως ἐν γαστρὶ λαμβάνει· αἱ γὰρ μῆτραι, κεκενωμένου τοῦ αἵματος, οὐ ξυλλάμβάνουσι τὴν γονὴν ὑπὸ ἀσθενείης.

[203] For examples of the female seed see Hippocrates, *Nature of the Child*, 1 Potter= L7.486.1 (12); *On Generation*, 5 Potter = L7.476.1-3; For different models of how the female seed or the matter produced by the female operates see King (1998) 9-11. See Connell (2016) 93-107 for the argument that Aristotle refers to a female seed.

> blood passes down from the mother and congeals, flesh is formed.[204] (Hippocrates, *On the Nature of the Child*, 3 Potter =L 7 492.8-20 [L14-15])

> ...neither the male himself nor the female emits semen into the male, but the female receives within herself the share contributed by both, because in the female is the material from which is made the resulting product.[205] (Aristotle, *Generation of Animals* I, 22 730a34-730b2)

The role of the menstrual fluid in providing the matter from which a life form can be made can be compared to the role of the earth in providing the matter from which the original body of man is formed. For example, in the Hippocratic *On Fleshes* where heat mixes with earth to form the human body.[206] Again, in the theories of the Preoscratic philosopher Xenophanes, everything is formed of earth and water.[207]

Two theories exist concerning what part the female plays in generation; (1) the menstrual fluid was the material from which the child was made (2) the menstrual fluid was the material needed to allow the seed to be nourished and to grow.[208] Both views show some similarity with the function of the earth whereby the earth not only provides the right condition for life to grow but also provides at least some of the material from which a life-form is made.

Cole discusses how the female is like a 'miniature agricultural landscape' which must be 'managed, tended and stimulated in order to reproduce the family'

[204] Καὶ αὔξεται ὑπὸ τῆς μητρὸς τοῦ αἵματος κατιόντος ἐπὶ τὰς μήτρας· τὰ γὰρ καταμήνια οὐ χωρέει, ὁκόταν γυνὴ λάβη πρὸς ἑωυτήν, ἢν μέλλῃ τὸ παιδίον ὑγιαίνειν...ἅμα δὲ τῃ πνοῃ ἑλκομένου εἴσω τοῦ αἵματος διὰ τοῦ ὑμένος...συμπήγνυται καὶ αὔξει τὸ μέλλον ζῷον ἔσεσθαι...κατιόντος τοῦ αἵματος ἀπὸ τῆς μητρὸς καὶ πηγνυμένου, σὰρξ γίνεται...

[205] οὔτ' αὐτὸ τὸ ἄρρεν προΐεται τὴν γονὴν οὔτε τὸ θῆλυ,ἀλλ' ἄμφω εἰς τὸ θῆλυ συμβάλλονται τὸ παρ' αὐτῶν γιγνόμενον, διὰ τὸ ἐν τῷ θήλει εἶναι τὴν ὕλην ἐξ ἧς ἐστι τὸ δημιουργούμενον.

[206] Hippocrates, *On Fleshes*, 2-3 Potter= L8.584-588 (2-3).

[207] Xenophanes: DK21 B29. For the popularity of this idea see Kirk, Raven, and Schfield (1983) 176.

[208] Dean-Jones (1994) 151-3.

when the woman is married.[209] We find a strong comparison of woman's body to the earth in Plato's *Menexenus* when he discusses the myth of Athens where the land itself gave birth to the Athenians. He states that his country was the only part of the earth to produce men and that women imitate his country because they also give birth to men strongly emphasising the connection between the function of the woman and the function of the fertile earth:[210]

> ...for it is not the earth that imitates the woman in the matter of conception and birth, but the woman the earth...[211] (Plato, *Menexenus*, 238a4-5)[212]

Moreover, the Earth as a goddess was sometimes worshipped as a nurturer of children and a place of growth in general receiving pregnant victims as her sacrifices.[213]

Another parallel between the earth and the female can be found in the fact that the land can also be incapable of producing offspring or can change from being fertile to being infertile like the body of a woman. For example, if a land is dry and hard it is described as 'barren' and the same applies to a female who cannot or will never produce offspring.[214] For example, Oedipus describes his daughters as 'barren'

[209] Cole (2004) 162; marriage in Athens was primarily to 'harvest lawful children': Menander, *Dyskolos*, 842-43 and see Seaford (2005) 117.
[210] Rigoglioso (2010) 20.
[211] οὐ γὰρ γῆ γυναῖκα μεμίμηται κυήσει καὶ γεννήσει, ἀλλὰ γυνὴ γῆν.
[212] For a brief discussion of how this passage links to the micro-/macrocosm in relation to Plato's concept of the demiurge see Partenie (2009) 16 n.16. For the context of the *Menexenus* as a mock funeral speech and its relation to other Platonic works see Allen (1984) 319-27. For a discussion of date of composition see Pappas and Zelcer who put the work in the early fourth century (2015) 30.For the use of traditional stories in the Menexenus used to glorify Athens see Pappas and Zelcer (2015) 146-150.
[213] Parker (2011) 76 and Parker (2005) 416 and 427.
[214]DuBois (1988) 78.

using the word χέρσος when he states that no one will marry them and they will never have any children. [215] This word χέρσος has a basic meaning of 'dry land.'[216]

Another important role the earth plays in its role as a mother is its nourishing function and again a parallel between the earth and the body of woman can be seen.[217] The earth as a place where life forms grow before they are born also resembles a womb in that the life forms are nourished inside the earth before they emerge from it and after they emerge from it.[218] For example, the author of the Hippocratic *On the Nature of the Child* draws a parallel between how the earth nourishes anything that grows from it and how a mother nourishes her child while it is in the womb:

> For I have explained that everything that grows in the earth lives from the moisture of the earth, and that whatever kind of moisture a particular earth has in it, this same kind of moisture a plant (*sc.* growing in it) will have too. In the same way, a foetus also lives from its mother in her uterus, and however much health the mother enjoys, the foetus will have too.[219]
>
> (Hippocrates, *Nature of the Child,* 16 Potter=L7.528.17 [L27])

He goes on to say that 'the growth of things out of the earth and human growth are exactly parallel.'[220] These examples indicate that, like a pregnant mother, the earth

[215] DuBois (1988) 78; ἀλλὰ δηλαδὴ χέρσους φθαρῆναι κἀγάμους ὑμᾶς χρεών (Sophocles, *Oedipus The King,* 1502).
[216] LSJ s.v. χέρσος.
[217] Hesiod, *Theogony,* 126-8; *Homeric Hymn Gaia* 1-5; Plato, *Menexenus,* 237e-238a.
[218] For example, Padel points out that the phrase 'the dark from which you came' refers to both the earth and the womb. Padel (1992) 100.
[219] Φημὶ γὰρ τὰ ἐν τῇ γῇ φυόμενα πάντα ζῆν ἀπὸ τῆς γῆς τῆς ἰκμάδος, καὶ ὅκως ἂν ἡ γῆ ἔχῃ ἰκμάδος ἐν ἑωυτῇ, οὕτω καὶ τὰ φυόμενα ἔχειν· οὕτω καὶ τὸ παιδίον ζῇ ἀπὸ τῆς μητρὸς ἐν τῇσι μήτρῃσι, καὶ ὅκως ἂν ἡ μήτηρ ὑγιείης ἔχῃ, οὕτω καὶ τὸ παιδίον ἔχει.
[220] Hippocrates, *Nature of the Child,* 16 Potter =L7.528.23-5 (27).

nourishes life within her until it is ready to be born and any nourishment the mother might receive is also received by the unborn child.

This idea is also apparent in Aristotle when he makes the analogy between how the embryo in the womb of a female draws nourishment from the uterus and how a plant takes nutriment from the earth: [221]

> Since the embryo is already potentially an animal but an imperfect one, it must obtain its nourishment from elsewhere; accordingly it makes use of the uterus and the mother, as a plant does of the earth, to get nourishment, until it is perfected to the point of being now an animal potentially locomotive.[222] (Aristotle, *Generation of Animals,* II, 4 740a24-7)

The analogy that a mother must also provide nourishment for her children when they are born is extended to the role of the earth. For example, Plato states when discussing the mythological origins of Athens that, as all mothers should, the earth feeds its brood by producing nourishment for men:

> Now our land, which is also our mother, furnishes to the full this proof of her having brought forth men; for, of all the lands that then existed, she was the first and the only one to produce human nourishment, namely the grain of wheat and barley, whereby the race of mankind is most richly and well nourished, inasmuch as she herself was the true mother of this creature.[223] (Plato, *Menexenus*, 237e-238a)

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[221] Dean-Jones, (1994) 207.

[222] Ἐπεὶ δὲ δυνάμει μὲν ἤδη ζῷον ἀτελὲς δέ, ἄλλοθεν ἀναγκαῖον λαμβάνειν τὴν τροφήν· διὸ χρῆται τῇ ὑστέρᾳ καὶ τῇ ἐχούσῃ ὥσπερ γῇ φυτόν, τοῦ λαμβάνειν τροφὴν ἕως ἂν τελεωθῇ πρὸς τὸ εἶναι ἤδη ζῷον δυνάμει πορευτικόν.

[223] μέγα δὲ τεκμήριον τούτῳ τῷ λόγῳ, ὅτι ἥδε ἔτεκεν ἡ γῆ τοὺς τῶνδέ τε καὶ ἡμετέρους προγόνους. πᾶν γὰρ τὸ τεκὸν τροφὴν ἔχει ἐπιτηδείαν ᾧ ἂν τέκῃ, ᾧ καὶ γυνὴ δήλη τεκοῦσά τε ἀληθῶς καὶ μή, ἀλλ’ ὑποβαλλομένη, ἐὰν μὴ ἔχῃ πηγὰς τροφῆς τῷ γεννωμένῳ. ὃ δὴ καὶ ἡ ἡμετέρα γῆ τε καὶ μήτηρ ἱκανὸν

Indeed, some authors even speak of primeval milk that was produced by the earth, thereby emphasising the parallels between the nourishment provided by the earth and that provided by the mother for her offspring.[224] In relation to this, Aristotle suggests that the nourishment provided by a mother is the same material from which a life form is born because the nature of milk and of menstrual fluid is the same since both are residues of nourishment.[225]

> That milk has the same nature as the secretion from which each animal is formed is plain...for the material which nourishes is the same as that from which nature forms the animal in generation...milk is blood concocted...while women are suckling children menstruation does not occur according to nature, nor do they conceive...this is because the nature of the milk and of the menstrual fluid is the same..[226] (Aristotle, *Generation of Animals*, IV, 8 777a4-15 [Barnes transl. modified after Peck and Louis])

Here, menstrual fluid as the material from which a life form is made is concocted and provides milk for the new baby.[227] Aristotle refers to nature in general in this passage, emphasising the idea that in the natural environment the same processes occur whereby the material used to form a life form is then used to nourish that life form.

τεκμήριον παρέχεται ὡς ἀνθρώπους γεννησαμένη· μόνη γὰρ ἐν τῷ τότε καὶ πρώτη τροφὴν ἀνθρωπείαν ἤνεγκεν τὸν τῶν πυρῶν καὶ κριθῶν καρπόν, ᾧ κάλλιστα καὶ ἄριστα τρέφεται τὸ ἀνθρώπειον γένος, ὡς τῷ ὄντι τοῦτο τὸ ζῷον αὐτὴ γεννησαμένη.

[224] Guthrie (1957) 37; cf. Archelaus of Athens: Diogenes Laertius 2.4.17; There is also a suggestion of milk springing from the earth in the *Bacchae*: Euripides, *Bacchae*, 708-10.

[225] Lloyd (1966) 369-370 n. 2.

[226] Ὅτι μὲν οὖν ἐστι τὸ γάλα τὴν αὐτὴν ἔχον φύσιν τῇ ἀποκρίσει ἐξ ἧς γίγνεται ἕκαστον, δῆλον… ἡ γὰρ αὐτὴ ὕλη ἥ τε τρέφουσα καὶ ἐξ ἧς συνιστᾷ τὴν γένεσιν ἡ φύσις…τὸ γὰρ γάλα πεπεμμένον αἷμά ἐστιν…οὐ γίγνονται δὲ οὔτε θηλαζομέναις αἱ καθάρσεις κατὰ φύσιν οὔτε συλλαμβάνουσι θηλαζόμεναι· κἂν συλλάβωσιν, ἀποσβέννυται τὸ γάλα διὰ τὸ τὴν αὐτὴν εἶναι φύσιν τοῦ γάλακτος καὶ τῶν καταμηνίων.

[227] For a discussion of coction see chapter 2.

The male reflected the heavenly sphere predominantly in his capacity as a generator where his semen corresponds to the heat and moisture originating in the heavenly sphere. The type of heat found to emanate from the heavens and the rain waters that fall to earth to create rivers that fertilise the earth is paralleled by the heat and moisture found in the semen. The female resembled the earth in her capacity as a womb and a provider of half the material from which a body is made as well as providing nourishment for her offspring.

Since the human body is a product of two sexes that reflect the heaven and the earth from which the original human body came, the micro-/macrocosm pattern is continued in the bodies of those who are not directly produced from the earth in the original formation of mankind. As such, the human body, whether female or male, reflects the form of the universe as well as how it functions and how it is maintained. The most prominent way in which the body reflects the universe is in its need for balance since balance is what causes the universe to remain as it is in its present state and what causes the human body to remain in health.

3. Balance in the micro-/macrocosm: the cause and cures of disease

The human body reflected the universe in how it functioned and one of the main ways in which it did this was its need for balance. The type of balance was that maintained by alternate ascendency of powers in both the human body and the natural environment in which no one power gains an ultimate dominance. This need for balance in the body to maintain health is a theory expounded first by Alcmaeon in the early fifth century and in the later fifth to early fourth century it is found again in *On Regimen* and *On the Nature of Man.*

In some theories, the universe depended on balance in order to survive in its current state. In Presocratic thought roughly contemporary with the treatises discussed in this part, Empedocles held that a balance between the two powers Love and Strife was vital in maintaining the universe as it now exists.[228] Heraclitus offered a variation on the theory of balance in the universe offered by Anaximander. In the only extant fragment attributed to him Anaximander proposes a theory of balance where one power pays retribution for injustice caused to another and so balance is maintained.[229] Heraclitus suggests that if change happened in one area of the universe change in the opposite direction would occur in another place to maintain the balance.[230]

In the human body, maintaining a balance was also important since any excess or dominance of a particular power caused disease. For example, Alcmaeon advanced the following theory:

> Alcmaeon holds that what preserves health is the equality of the powers – moist, dry, cold, hot, bitter, sweet, and the rest – and sole rule by any one of them causes disease: for sole rule by any of these is destructive. Disease comes about on the one hand through an excess of heat or cold; on the other hand through surfeit or lack of nutriment; its location is the blood, marrow, or brain. Disease may also sometimes come about from external causes, from

[228] KRS 360 = DK31 B35 and Kirk, Raven, and Schofield (1983) 296-7. For a date of the mid- fifth century ascribed to Empedocles see p.81 n.248.
[229] KRS 110=DK12 A9 with commentary in Kirk, Raven and Schofield (1983) 118. A date of the mid-sixth century is generally given for Anaximander. See Kirk, Raven, and Schofield (1983) 100-101.
[230] KRS 211 and 212. Kirk, Raven, and Schofield (1983) 193-4 and Lloyd (1966) 214-6 for a discussion of this idea and its relation to Anaximander. For the date of 500BC for Heraclitus see p.11 n. 28.

> the quality of the water, local environment, overwork, hardship or something similar. Health, by contrast, is a harmonious blending of the qualities.[231]
>
> (Aetius, *On the Opinions of the Philosophers*, 5, 30, 1=DK24B4. [Longrigg transl. modified after Nutton]) [232]

In the Hippocratic Corpus, the treatise *On Regimen* I offers the idea that the universe and everything in it is made up of fire and water and they are kept in perfect balance by alternate ascendency so neither become completely dominant:

> Neither, however, can become completely master…if ever either were to be mastered first, nothing that exists now would be as it is now.[233] (Hippocrates, *On Regimen*, I, 3, 126.15-17 Joly-Byl =L6.474.2-4)

As a microcosm of the universe mankind is also made of fire and water and both exist in a state of balance that relies on alternate ascendancy where one power cannot become completely dominant. These forces must be kept in balance by a good regimen of exercise and diet according to this author but he must also watch for change in the universe in order to balance with it:

> A man must observe the risings and settings of stars that he may know how to watch for change and excess in food, drink, wind and the whole universe,

[231] Τῆς μὲν ὑγιείας εἶναι συνεκτικὴν τὴν ἰσονομίαν τῶν δυνάμεων, ὑγροῦ, ξηροῦ, ψυχροῦ, θερμοῦ, πικροῦ, γλυκέος καὶ τῶν λοιπῶν, τὴν δ' ἐν αὐτοῖς μοναρχίαν νόσου ποιητικήν·φθοροποιὸν γὰρ ἑκατέρου μοναρχίαν. Καὶ νόσον συμπίπτειν ὡς μὲν ὑφ' οὗ ὑπερβολῆι θερμότητος ἢ ψυχρότητος, ὡς δὲ ἐξ οὗ διὰ πλῆθος τροφῆς ἢ ἔνδειαν, ὡς δ' ἐν οἷς ἢ αἷμα ἢ μυελὸν ἢ ἐγκέφαλον. ἐγγίνεσθαι δὲ τούτοις ποτὲ κἀκ τῶν ἔξωθεν αἰτιῶν, ὑδάτων ποιῶν ἢ χώας ἢ κόπων ἢ ἀνάγκης ἢ τῶν τούτοις παραπλησίων. τὴν δὲ ὑγείαν τὴν σύμμετρον τῶν ποιῶν κρᾶσιν.

[232] For a brief discussion of the highly political terms here and for the source of this translation see Nutton (2013) 48. Longrigg III.2 Alcmaeon most probably lived in the early fifth century BC roughly contemporary with Parmenides. Kirk, Raven, and Schofield (1983) 240, 260 and 339.

[233] Οὐδέτερον δὲ διὰ ταῦτα δύναται κρατῆσαι παντελῶς...εἰ δέ ποτε κρατηθείη καὶ ὁπότερον πρότερον, οὐδὲν ἂν εἴη τῶν νῦν ἐόντων ὥσπερ ἔχει νῦν.

from which things diseases exist among men.[234] (Hippocrates, *On Regimen*, I, 2, 124.14-17 Joly-Byl =L6.470.10-13)

The human body also reflects the ascendency of different powers in the natural world as seasons rotate in the Hippocratic Corpus. For example, the treatise *On the Nature of Man* expounds this type of theory most clearly where the humours change with the seasons and it is worth quoting at length to show how this process occurs:

> Phlegm increases in man in winter; for phlegm, being the coldest constituent of the body, is closest akin to winter…That winter fills the body with phlegm you can learn from the following evidence. It is in winter that the sputum and nasal discharge of men is fullest of phlegm; at this season mostly swellings become white, and diseases generally phlegmatic. And in spring too phlegm still remains strong in the body, while the blood increases. For the cold relaxes, and the rains come on, while the blood accordingly increases through the showers and the hot days. For these conditions of the year are most akin to the nature of blood, spring being moist and warm…and in summer blood is still strong and bile rises in the body and extends until autumn…autumn is dry and begins from this point to chill him (man.) It is black bile which in autumn is greatest and strongest…[235] (Hippocrates, *On Nature of Man*, 7, 182.4-184.14 Jouanna = L6.46.9-48.18)[236]

[234] ἄστρων τε ἐπιτολὰς καὶ δύσιας γινώσκειν δεῖ, ὅκως ἐπίστηται τὰς μεταβολὰς καὶ ὑπερβολὰς φυλὰσσειν καὶ σίτων καὶ ποτῶν καὶ πνευμάτων καὶ τοῦ ὅλου κόσμου, ἐξ ὧνπερ τοῖσιν ἀνθρώποισι αἱ νοῦσοι εἰσίν.

[235] Αὔξεται δὲ ἐν τῷ ἀνθρώπῳ τὸ φλέγμα τοῦ χειμῶνος· τοῦτο γὰρ τῷ χειμῶνι κατὰ φύσιν ἐστὶ μάλιστα τῶν ἐν τῷ σώματι ἐνεόντων, ψυχρότατον γάρ ἐστιν...ὅτι δὲ ὁ χειμὼν πληροῖ τὸ σῶμα φλέγματος, γνοίης ἂν τοῖσδε· οἱ ἄνθρωποι πτύουσι καὶ ἀπομύσσονται φλεγματωδέστατον τοῦ χειμῶνος, καὶ τὰ οἰδήματα λευκὰ γίνεται μάλιστα ταύτην τὴν ὥρην, καὶ τἆλλα νοσήματα φλεγματώδεα. τοῦ δὲ ἦρος τὸ φλέγμα ἔτι μένει ἰσχυρὸν ἐν τῷ σώματι, καὶ τὸ αἷμα αὔξεται· τά τε γὰρ

This is a clear indication that the human body is a copy of the whole and as such follows the rotation of the seasons in the predominance of its four humours imitating the way in which the universe balances. However, as the seasons rotate the predominance in certain humours cause certain diseases.[237] Indeed, a disease pattern dictated by a regular weather pattern was considered healthy in other Hippocratic texts such as *Airs, Waters, Places* and *Epidemics* since there was nothing out of the ordinary about it.[238]

Throughout the Hippocratic Corpus, the human body reflects the weather in the disease patterns and ailments that occur. Disease is cured by attempting to deal with any excess or deficiency in the human body and so potential causes of such imbalances such as a change in weather were watched for and noted for their effects on the body.[239] Working on the principle that the human body worked in the same way as the natural environment, ancient physicians used their observations of powers such as heat and cold in the natural world and the effects these took and applied them to the human body.

Conclusion

ψύχεα ἐξανίει, καὶ τὰ ὕδατα ἐπιγίνεται, τὸ δὲ αἷμα κατὰ ταῦτα αὔξεται ὑπό τε τῶν ὄμβρων καὶ ὑπὸ τῶν θερμημεριῶν· κατὰ φύσιν γὰρ αὐτῷ ταῦτά ἐστι μάλιστα τοῦ ἐνιαυτοῦ· ὑγρόν τε γάρ ἐστι καὶ θερμόν...τοῦ δὲ θέρεος τό τε αἷμα ἰσχύει ἔτι, καὶ ἡ χολὴ αἴρεται ἐν τῷ σώματι καὶ παρατείνει ἐς τὸ φθινόπωρον·...ξηρόν τε γὰρ ἐστι τὸ φθινόπωρον καὶ ψύχειν ἤδη ἄρχεται τὸν ἄνθρωπον· ἡ δὲ μέλαινα χολὴ τοῦ φθινοπώρου πλείστη τε καὶ ἰσχυροτάτη ἐστίν.

[236]Craik suggests *On the Nature of Man* dates to the last decades of the fifth century owing to a reference to Melissos who held an important military position in 440BC: Craik (2015) 212. Jouanna suggests a date of 410-400BC: see Jouanna (1975) 60.

[237] For other treatises that associate have similar associations with the humours cited here see Jouanna (1975) 270 n.182,14 and 182,16.

[238] See Chapter Three p.208-30.

[239] For balancing deficiencies and excess in the human body: *On Nature of Man,* 9 l.1-11 Potter = L6.52.4-11. See Chapter 2 in general for further examples. See the *katastaseis* of the *Epidemics* and notes made about change in the weather in *Airs, Waters, Places* 1 Jones = L2.12 (1).See Chapter 3 pp.220-230 for a full discussion.

Several different models of the micro-/macrocosm pattern of thought may be found in the texts studied above. The two most explicit are seen in *On Regimen* I and *On Sevens,* for these two treatises offer a comparison advancing a complete model for how the human body reflects the universe and vice versa. In other medical texts, trace of a micro-/macrocosm model can be found in different descriptions that draw analogies between natural environment and human body, metaphorically describe parts of the human body as parts of the natural world, or offer identical descriptions of processes that occur in both the natural world and the human body.

The way in which the micro-/macrocosm theory came about may have originated in ideas associated with the birth of the original race of men from the earth, which can be traced throughout the literature examined in this thesis. Since the earth and heavens mixed to create the human body, the human body reflects the natural world in its form and processes. The male body reflects the heavens as a generator of life and a carrier of seed and the female reflects the earth as an incubator and a provider of material from which a body can be shaped. The process of reproduction in human bodies reflects that of the original generative process and so the human body continues to reflect the universe as microcosm since it is still formed of a material that reflects the earth and is engendered with life by a power that reflects the generative power found in the heavenly sphere.

As a product of the natural world and a body that reflects it, the human body works in very much the same way as the natural environment. In the macrocosm a certain balance must be kept to keep the universe as it is now. In the human body, balance must be maintained to maintain health. The natural environment can create imbalance in the human body which in turn causes disease and cures were fathomed to restore balance in the body.

The waters a body consumes, the air it breathes and the climatic conditions it experiences all contribute to causing imbalance in the body and a particular set of diseases depending on its natural environment. In the next chapter, the effects of different natural phenomena on the human body will be explored to properly understand how a human body reflects the natural environment and climate that it inhabits.

Chapter 2

Introduction: the porosity of the body

This chapter will explore the effects of individual natural phenomena on the human body and will be split up into three sections exploring the effects of three regions of the universe: the earth and waters, airs and winds, and the heavenly sphere with its heavenly bodies. It will show how the human body reflects the natural environment and changes with it through demonstrating how the processes occurring within the human body reflect the phenomena that occur in the natural environment.

By way of introduction a few remarks are needed on the skin where the porosity of the body and its exposure to waters, airs and temperature allow change to occur within the human body. There are many ways in which the natural environment impacts on the internal processes of the human body, the most obvious

being through the nose and mouth when the body breathes in or when it drinks. But the skin is the more important aspect because it is the greater surface area through which the natural environment can come into the body. It is the skin that allows moisture, airs, and heat in and out of the body as a porous material lying between the inner processes of the human body and the natural environment. Owing to the fact that it acts as such an open passage means that the natural environment can enter the body affecting and changing the processes occurring within it.

In modern scholarship, this question of how porous the body is has primarily been studied in relation to air taken into the body. Harris, Furley and Wilkie, and Thivel discuss the skin as a porous layer in Hippocratic and Presocratic thought.[240] They examine the process of breathing where the whole body takes air in and it travels through the body via the blood and is then expelled.[241] Brooke Holmes addresses this question in relation to immortal and mortal harm brought to the body in the form of attacks from the gods and war wounds from weapons in Homer.[242] She suggests that the body cannot be seen simply as a three-dimensional entity but it acquires another dimension where the body is a 'concealed inner space implicated in automatic physical processes' and the skin is its veil.[243] For her, the boundaries of the body cannot be reduced to the '"seen" three-dimensional object' and this raises the question of the skin as a barrier and how opaque the human body really is.[244] Modern scholars generally approach the skin as a natural barrier separating the human body off from the natural environment and the question asked is what does the skin let in from the outside world? I approach this from a different angle not only

[240] For a discussion of the different terms for air inside and outside the body see pp.120-1.
[241] Harris (1973) 15-20, 106; Thivel (2005) 239-51; Furley and Wilkie (1984) 5-8.
[242] Holmes (2010) 58-78.
[243] Holmes (2010) 21.
[244] Holmes (2010) 21.

asking to what extent the natural environment can come into the human body but also how the skin acts as a passage out of the body for powers such as heat and moisture when the natural environment changes.

The body is a permeable entity that allows natural forces to enter and to change the systems at work under the skin. A good example of the porosity of the skin is the process of breathing through the skin found in both Hippocratic and Presocratic thought. In *On the Sacred Disease,* the breath is taken in through vents (ἀναπνοαί) that lead to the veins.[245] The veins then spread the breath throughout the body:[246]

> By these veins we take in the greater part of our breath, for they are vents of our body, drawing the air to themselves, and they spread it over the body in general through the minor veins and cool it; then they breathe it out again. [247] (Hippocrates, *On the Sacred Disease,* 4 (Jones: 7) 2.12.10-14 Jouanna =L6.368.1-4)

A similar theory to that seen in *On the Sacred Disease* can be found in the theories of Empedocles.[248] In his theories, air is taken in by both the nostrils and the pores (πόροι) of the body.[249]

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[245] See Jouanna's commentary for the widespread use of ἀναπνοαί for evnts of the body designed for the passage of air in and out: (2003) 72 notes to page 12 n.2.

[246] For the dates of *On the Sacred Disease,* Craik offers mid-late fifth Century: 2015 195 and Laskaris only commits to the fifth century: (2001) 1.

[247] Κατὰ ταύτας δὲ τὰς φλέβας καὶ ἐσαγόμεθα τὸ πουλὺ τοῦ πνεύματος· αὗται γὰρ ἡμέων εἰσὶν ἀναπνοαὶ τοῦ σώματος τὸν ἠέρα ἐς σφᾶς ἕλκουσαι, καὶ ἐς τὸ σῶμα τὸ λοιπὸν ὀχετεύουσι κατὰ τὰ φλέβια, καὶ ἀναψύχουσι καὶ πάλιν ἀφιᾶσιν. See Jouanna's discussion for the prevalence of the idea that air and blood occupy the veins in ancient medicine during the fifth and fourth centuries (2003) 72 n.1.

[248] For the date of Empedocles see Guthrie who puts his life between 492 and 432BC: (1965) 128 with n.2; Wright puts the dates at between 477-432BC from the few fragments we have that offer enough information for us to guess at a date: (1981) 3-6; See Inwood's introduction of *The poem of Empedocles* for a discussion of Empedocles' life and date: (1992) 6-8. But the exact dates are guesswork and one can only say mid fifth century making Empedocles roughly contemporary with *On the Sacred Disease.*

The porosity of the skin is not only important for the entry of air into the body's system it is also important for the entry and exit of moisture and heat that does not occur through the process of breathing. In the Hippocratic Corpus, heat whether it is emanating from the sun or in winds and waters draws moisture to itself which can have a drying effect on the body when it draws moisture from it.[250] The body's own heat also performs this action and can draw moisture through the skin from the natural environment moistening the body's insides.[251] A cold environment can lead to a moist body since the body's heat is warmer than the outside and draws moisture to it. A hot environment has the opposite effect drawing moisture from the body through the skin in the form of sweat and drying it out.[252]

These processes can also occur in a different way. A warm wind was considered to moisten the body rather than dry it out and a cold wind dried more than it moistened. Here, heat has worked in the same way attracting moisture to itself but has brought this moisture to the body and to the natural world. Rather than taking moisture away through the skin like the heat of the sun or hot water for example, the wind has deposited moisture on the body, which can enter through the skin. A cold wind, in contrast, does not allow this settling of moisture to take place making it more of a drying wind.[253]

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[249] Empedocles: DK31 B100. For a discussion of whether Empedocles is talking about skin breathing or breathing through the nose in this passage see Harris (1973) 16-17 and Wright's commentary on the fragment (1981) 244-46. See LSJ s.v. πόρος this term translates as pores or passageways, openings or ducts when referring to the body.

[250] See in particular *Airs, Waters, Places* 8, l.5-15 Jones = L2.32.3-34.3 on moisture drawn from everything in the natural world, including mankind, by the sun and for a full discussion of this process see p.155.

[251] See pp.86-7 for the effects of smearing moist earth over the parts of the body that have excessive heat.

[252] For the effects of the sun see pp. and for the effects of hot and cold baths see pp.90-1.

[253] See pp. for a full discussion of the effects of hot and cold winds: pp.129-151.

Thus, the skin allows the passage of moisture into and out of the body with a change of temperature. There is no suggestion that it changes as temperature levels change nor does it regulate the effects of the natural environment, rather it is an unchanging, porous entity that allows airs, moisture and heat to enter the body and leave it causing change in the body. As a porous entity, the skin allows the natural environment to penetrate the body and affect the systems at work under the skin. The fact that the natural environment can enter through the skin and the skin is not an entirely opaque barrier to the natural world means that the human body changes with the natural world as it changes.

The effects of different natural phenomena on the human body are synonymous with the effects that they have in the natural world because the processes occurring in the natural world and in the body are identical. A change in heat or in moisture levels has a profound effect on both the human body and the natural world where different diseases and ailments in the human body can be compared to different phenomena occurring in the natural world.

Earth and Waters

Introduction: Earth, waters, and the human body

Earth and waters such as lakes, springs, and marshes will be treated together in this section because they are often mixed in ancient theories in both the natural world and within the human body. This section will be split into two parts. In part 1, the effects of different earths and waters will be examined in relation to both the exterior of the body and its insides.[254] The texts included Hippocratic works such as *Airs, Waters,*

[254] Pp.85-97.

Places, On the Use of Liquids, Internal Affections, and *On Diseases* III.[255] The works of Aristotle, in particular *Meteorology,* will also be brought in to examine and further elucidate the ways in which different waters and earths affected the body.The texts examine the different natures of waters and waters mixed with earth and the effects they take on the exterior surface of the body when applied such as the flesh and the skin as well as the effects they have on the organs of the body when they are consumed. Rain waters will be explored in this section where they are used as drinking waters. They will also be discussed in the following section for their effects when brought on the winds.

The second part explores the life cycle of waters and its relation to the life cycle of mankind shedding new light on the effects of water on the human body at different stages in its course in relation to ancient medical ideas and their ties to popular beliefs and attitudes towards different types of water.[256] The mix of earth and water has strong links to fertility in both the natural world and in the human body. Indeed, there is a strong link between the life cycle of a human and the river's course where the beginning of the river's course has connections to fertility, child birth and the youth and the end of it has associations with death, disease, and old age. The views concerning the nature and effects of springs at the beginning of a river's life and those concerning marshes at the end of its life in *Airs, Waters, Places* will be examined in conjunction with Aristotle's *Meteorology* to offer ideas for why certain waters had certain effects on the human body and will also be compared to ideas found in religious cult and mythology about spring waters and marshes to explore and compare ideas in two different systems of thought.

[255] The treatises *Airs, Waters, Places* and *On Diseases* III are roughly contemporary dating to the mid-late fifth century: Craik (2015) 11 and 184. The treatises *Internal Affections* and *On* Diseases I are both likely to be early fourth century: Craik (2015) 140 and 174.
[256] Pp.97-118.

1. The effects of earth and waters on the body

Effects on the exterior of the body

In the Hippocratic treatises *Internal Affections* and *On Diseases* I and III, the physicians used a mix of earth and water for their cooling properties on the skin for ailments on the skin's surface and beneath the skin in the flesh and tissues.[257] In most medical and philosophical texts that describe the nature of the universe, the earth is the cold and dry part of the universe. The author of *On Fleshes* states that the earth is 'cold and dry and in great motion' and Aristotle names it the cold and dry element in his system of four elements.[258] Earth is also a heavy element and this is why it sits at the centre of the universe but water is lighter and part of it can be drawn up into the atmosphere by the heat of the sun.[259] Water is naturally cold and wet in the theories of ancient philosophers and physicians but can change from hot to cold as well as having both moistening and drying effects.

The mix of earth and water will be treated first. Ancient physicians applied what they observed in the natural environment to their cures on the assumption that the human body imitated the natural world. As the naturally cold elements, earth and water were used to cool the body through processes that reflect the natural environment. The addition of earth to water added an extra cold element that calms the heat of the body. An excess of heat in the body is tempered through heat's

[257] These treatises are roughly contemporary, though *On Diseases* I may be a little later suggesting a continuation of theories into the early fourth century. See n. for dates. See Craik for further similarities between *Internal Affections* and *Diseases* III: (2015) 183-4.
[258] Hippocrates, *On Fleshes,* 2 Potter =L8.584.13-14 (2); Aristotle, *On Generation and Corruption,* II, 3 330b5.
[259] Heavy elements: Aristotle, *On the heavens,* I, 3 269b26-30; light part of water drawn up: Hippocrates, *Airs, Waters, Places,* 8, l.3-5 Jones=L2.32.18-19; Aristotle, *Meteorology,* I, 9 346b33.

natural ability to draw cool moisture to itself found in both the natural environment and in the human body.[260]

When attempting to cool the body, the author of *Internal Affections* suggests that 'potter's earth' (κεραμικῇ γῇ) should be plastered over the patient.[261] The author suggests this treatment in the event that cold water does not work in cooling the patient sufficiently.[262] The earth termed 'potter's earth' we may assume is a mix of earth and water to form a type of clay.[263] By mixing earth and water together to form 'potter's earth' the cold part of these two naturally cold elements is augmented.

Another use of moist earth in these Hippocratic treatises was to determine where an excess of a bodily fluid lay in the body. For example, in *On Diseases* III, the author suggests plastering a chest full of pus in linen soaked with warm, moist, finely titrated Eretrian earth. Where the earth becomes dry first is where the physician should incise or cauterize in order to take away the pus.[264] This method of smearing earth over an area that may contain a large amount of pus that cannot be detected easily when examining the body is also found in *On Diseases* I where the author states that the pus dries out the earth when the earth is smeared over the skin of the patient:

> …if you plaster the patient over with potter's earth or some other such material, the pus dries it up in a short time. [265] (Hippocrates, *On Diseases* I, 17 Potter=L.6.170.20-1 [17])

[260] See pp.47-53 for an example of heat's ability to draw moisture to itself in the process of the water cycle and in the formation of bladder stones.
[261] Hippocrates, *Internal Affections,* 7 Potter= L7.184.13.
[262] Hippocrates, *Internal Affections,* 7. Potter =L7.184.9-14.
[263] Villard (1992) 472.
[264] Hippocrates, *On Diseases* III, 16 Potter = L7.154.6-8.
[265] καὶ ἢν καταπλάσῃς τῇ κεραμίτιδι ἢ ἄλλῳ τῳ τοιούτῳ, ἀποξηραίνει δι' ὀλίγου.

The explanation for this lies earlier in *On Diseases* I where an ulcer from a tear in the bodily tissues is described. Pus is produced by the tear and moisture is attracted to it because of the heat. Here, pus is a product of heat and may even be hot itself.[266] Heat in the body is behaving like heat in the natural environment attracting the finest parts of liquid to itself and leaving the heavier, earthier part. This explains why moist earth, once spread over the infected area, can detect pus because the heat attracts the moisture from the earth plastered on the body and dries it out. Villard is correct in his work on the use of earth in the Hippocratic Corpus that the moisture in the earth is used to detect the pus and the cold part of the potter's earth is used to treat it in this treatise.[267] The mechanism for this effect is the process whereby the heat within the pus draws water from earth sp-read over it and explains how moist earth cools the area since the heat is attracting the cool moisture to it.

Water with an earthy admixture such as salt water could also be used to dry the body. This effect is probably due to the amount of salt in the water, which was the earthier, drier part of water.[268] The author of *On the Use of Liquids* states that sea water dries up lesions on the skin.[269] Aristotle explains that salt waters must once have been hot and the earth gives them their flavour:

> Most salt rivers and springs must once have been hot. Then the original fire in them was extinguished but the earth through which they filter preserves the character of lye or ashes. Springs and rivers with all kinds of flavours are found in many places. These flavours must in every case be due to the fire that is present or produced in them; for if you expose earth to different

[266] Hippocrates, *On Diseases* I, 15 Potter=L6.166.22-168.2.
[267] Villard (1992) 472.
[268] See above p. 85.
[269] Hippocrates, *On the Use of Liquids*, 3 Potter = L6.126.9-13.

> degrees of heat is assumes various kinds and shades of flavour. It becomes full of alum and lye and other things of the kind, and the fresh water percolates through these and changes its character. [270] (Aristotle, *Meteorology*, II, 3 359b5-14 [modified after Louis])

Here, the waters pick up different types of earth as they percolate through the earth and this changes its nature. But the fact that these waters were once heated suggests that the heat dried them out leaving the earthy, salty part behind. Owing to the abundance of this earthy part, the waters are particularly dry because the earth is fundamentally a drying agent. The use of salt water as a drying agent can be compared to its use in *Airs, Waters, Places* where the physician describes it as having a hardening effect on the digestive organs because it dries them up.[271]

For the particular effects of different waters when applied to the body (i.e when they are not used as drinking waters) we must turn to the treatises *On the Use of Liquids, On Places in Man,* and *Airs, Waters, Places.*[272] Waters in these treatises have different qualities apart from hot and cold and the qualities they possess extend to the human body when applied to it. For example, in *Airs, Waters, Places,* waters in the natural world are described as hard (σκληρά) if they are cold and this hardness extends to the bodies of the inhabitants of a place with hard waters.[273] Indeed, the same word is used in the Greek to describe parts of the human body, for example, the

[270] ὅσα δ' ἐστὶν ἁλμυρὰ ῥεύματα ποταμῶν ἢ κρηνῶν, τὰ πλεῖστα θερμά ποτε εἶναι δεῖ νομίζειν, εἶτα τὴν μὲν ἀρχὴν ἀπεσβέσθαι τοῦ πυρός, δι' ἧς δὲ διηθοῦνται γῆς, ἔτι μένειν οὖσαν οἷον κονίαν καὶ τέφραν. εἰσὶ δὲ πολλαχοῦ καὶ κρῆναι καὶ ῥεύματα ποταμῶν παντοδαποὺς ἔχοντα χυμούς, ὧν πάντων αἰτιατέον τὴν ἐνοῦσαν ἢ ἐγγιγνομένην δύναμιν πυρός· καομένη γὰρ ἡ γῆ τῷ μᾶλλον καὶ ἧττον παντοδαπὰς λαμβάνει μορφὰς καὶ χρόας χυμῶν· στυπτηρίας γὰρ καὶ κονίας καὶ τῶν ἄλλων τῶν τοιούτων γίγνεται πλήρης δυνάμεων, δι' ὧν τὰ ἡθούμενα ὕδατα ὄντα γλυκέα μεταβάλλει.
[271] Hippocrates, *Airs, Waters, Places,* 7, l.95-100 Jones = L2.32.11-15.
[272] *On the Use of Liquids, On Places in Man, and Airs, Waters, Places* are all roughly contemporary dating from mid-late fifth century BC: Craik (2015) 159, 162, and 11. For the discussion of a later date for *On the Use of Liquids*: Craik (2015) 159.
[273] Hippocrates, *Airs, Waters, Places,* 4, l. 6-8 Jones =L2.18.22-23.

hard digestive organs of the inhabitants (σκληρὰς) and their hard heads (σκληρότης). The eye diseases suffered in this city are also described as hard (σκληράς).[274]

Again, warm and cold waters have opposite natures and, therefore, have opposite effects on the body when applied in the same way. Warm waters relax and soften the body and cold waters harden and contract it when applied directly to the skin. For example, in *On the Use of Liquids,* the physician suggests moistening ulcerated skin with warm water since it softens hard skin.[275] Cold water makes the skin hard around sores and so is not suitable for treating this type of condition since the water augments the hardness of the skin by contracting it further.[276] Here, what is contracted is relaxed by heat and what is warm and relaxed is contracted by cold in the human body. Water restores balance to the body by tempering it curing illnesses brought on by that which is opposite to its nature.[277] For example, warm water cures illnesses brought on by the cold such as convulsions and spasms:[278]

> Poured over the head and other parts of the body, it (warm water) promotes sleep; it is soothing to convulsions and spasms; it blunts the pains of the ear, of the eyes and such like.[279] (Hippocrates, *On the Use of Liquids,* 1 Potter =L6.118.11-13)

Warm water is relaxing and soothes ailments brought on by the cold that attack the parts that are naturally cold such as the brain, bones, teeth and cords.[280] In the same way, the parts that are naturally warm are irritated by heat and soothed by cold.[281]

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[274] *Airs, Waters, Places,* 4, l.10. l.19-20, l.35-7 Jones = L2.20.1;20.8; 22.3-4.
[275] Hippocrates, *On the Use of Liquids,* 1 Potter =L6.118.6-7.
[276] Hippocrates, *On the Use of Liquids,* 6 Potter = L6.134.2-3.
[277] See part on balance above pp.73-7.
[278] Cf. Hippocrates, *On the Use of Liquids,* 2 Potter =L6.122.1-126.8.
[279] Ὑπνικὸν καὶ κατὰ κεφαλῆς καὶ ἄλλων· σπασμῶν, τετάνων παρηγορικόν· ὀδύνας κωφοῖ ὠτὸς, ὀφθαλμῶν, ὅσα τοιαῦτα.
[280] Hippocrates, *On the Use of Liquids,* 2 Potter =L6.122.3-8.

The same treatise goes on to say that after an affusion of hot water the body is harder because it is more dried out.[282] At first glance this seems to be an opposite effect to what we saw above where warm water is moistening. In fact, heat is always drawing moisture to itself and is therefore acting in the same way in both the moistening effect and the drying effect. The heat of the waters used to soften the skin has drawn moisture to itself making them more moist when applied and that heat and moisture is transferred to the skin. When the body is submerged in water during bathing the warm water is not moistening because it causes the whole body to sweat. Here the heat surrounds the body in the water and so draws moisture from it. This would explain the passage in *On Places in Man* where the physician states that to treat pleurisy bathing must take place in order to induce sweating:

> ...on the fourth day give the patient a bath...in order that through bathing sweating will be induced.[283] (Hippocrates, *On Places in Man,* 17 Potter =L6.310.2-5 [modified after Craik])

For this author, bathing has the effect of drying the body since the moisture is being drawn out of the body. It can be assumed that these baths are warm since moisture is drawn out of the body by the heat of the water. Here, the warm water is drawing moisture from the body to itself and drying the body out rather than moistening it.

The treatise *On the Use of Liquids* also states that cold water dries up sweating suggesting that moisture is not drawn from the body in this instance but is kept within the body by the body's own heat.[284] When submerged in cold water during bathing, the body does not sweat because moisture is not drawn from it and

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[281] Hippocrates, *On the Use of Liquids,* 2 Potter = L6.122.10-14.
[282] Hippocrates, *On the Use of Liquids,* 2 Potter =L6.126.6-8.
[283] καὶ λουτροῖσι χρῆσθαι τεταρταίοισιν· …ὡς ὑπὸ τοῦ λουτροῦ ὁ ἱδρὼς ἐγγένηται.
[284] Hippocrates, *On the Use of Liquids,* 6 Potter=L6.132.3-4.

so does not dry the body. This suggests a moistening effect where the body retains its own moisture because cold water does not draw sweat from it like hot water.

Hot and cold waters could have both a drying and a moistening effect. When applied to the skin and left exposed to the air warm waters moisten and cold waters dry. When the body is submerged during bathing, warm waters dry and cold waters moisten. The mechanism for this effect is not explained in the Hippocratic texts. I suggest that the submersion of the body causes the heat or cold of the water to act on the body as an external force whereas when waters are applied to the skin and left exposed to the air the water and its nature becomes part of the body transferring its nature to the skin.

In order to moderate the body, physicians used the different temperature of waters and earth mixed with water to treat various ailments. Moisture is drawn into and out of the body through the skin when earth is plastered over the body or when the body is bathed through the effects of temperature. These treatments not only heated or cooled the body but also dried and moistened it and produced hardness and softness. Heat and cold could produce both moistness and dryness in the natural world and the body owing to heat's natural ability to draw moisture to itself. Heat could either take moisture away from the human body, drying it out in a hot bath causing it to sweat or it could bring moisture to the human body depositing it there when applied to the skin. The cold quells the drawing of moisture from the human body such as sweating and as such is conductive to moisture and it also dries and hardens the body when applied to the skin.

Effects on the interior of the body

All water contains an earthier part in the form of mud or brine. Depending on the type of water, the amount of sediment within it varies. For example, the sea is salty and therefore contains the greatest amount of sediment. Aristotle states that this is because all waters flow into it:

> How can the admixture of this earth have such a striking effect in a great quantity of water and not in each river singly? For the sea, differing in nothing from rivers but in being salt, is evidently simply the totality of river water, and the rivers are the vehicle in which that is carried to their common destination. [285] (Aristotle, *Meteorology,* II, 3 357a20-23)

The process of silting in rivers and lakes was also recognised. Aristotle tells of the lake Maeotis which he believes was originally produced by many rivers flowing into it but eventually silted up entirely.[286]

The drinking of particular waters have a profound effect on the areas of the body that contain fluids as well as the bodily fluids themselves. Indeed, the effect of waters on the inside of the body tends to depend on how much sediment is contained in the water consumed. If there is much sediment in the water or if the water contains more of an earthy part than it does a moist part, the veins and the fluids within the body become clogged with this earthy part reflecting the nature of the water that was consumed. The author of *Airs, Waters, Places* has a similar theory about mixed waters from different places when he discusses rivers or lakes that have many rivers

[285] πῶς γὰρ δυνατὸν ἐν πολλῷ μὲν πλήθει ὕδατος ἐπίδηλον οὕτως ποιεῖν τὴν μεῖξιν τῆς τοιαύτης γῆς, ἐν ἑκάστῳ δὲ μή; δῆλον γὰρ ὅτι ἡ θάλαττά ἐστιν ἅπαν τὸ ποτάμιον ὕδωρ· οὐδενὶ γὰρ διέφερεν ἀλλ’ ἢ τῷ ἁλμυρὰ εἶναι τῶν ποταμῶν· τοῦτο δ’ ἐν ἐκείνοις ἔρχεται εἰς τὸν τόπον εἰς ὃν ἀθρόοι ῥέουσιν.
[286] Aristotle, *Meteorology,* I, 14 353a1-6.

flowing into them. For example, he states that mixed waters have the following effect on the body:

> Such waters then must leave a sediment of mud and sand in the vessels, and drinking them causes the diseases mentioned before. [287] (Hippocrates, *Airs, Waters, Places,* 9, 2.209.4-6 Jouanna =L2.38.7-9)

From this, we may assume that this author believed that mixed waters such as large rivers had a greater amount of sediment in them than in smaller rivers or springs.

Earth inside the body had a great effect on the body where the fluids and the organs carrying the fluids contain an earthy sediment. The author of *Airs, Waters, Places* describes the diseases that occur when a person drinks waters of very many different kinds:

> Stone, kidney disease, strangury and sciatica are very apt to attack people, and ruptures occur, when they drink water of very many different kinds, or from large rivers, into which other rivers flow, or from a lake fed by many streams of various sorts, and whenever they use foreign waters coming from a great, not a short distance. For one water cannot be like another; some are sweet, others are impregnated with salt and alum, others flow from hot springs. These when mixed up together disagree, and the strongest always prevails. [288] (Hippocrates, *Airs, Waters, Places,* 9, 2.208.10-209.2=L2.37.20-38.5)

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[287] ...ὑφίστασθαι οὖν τοῖσι τοιούτοισιν ἀνάγκη ἐν τοῖς ἀγγείοις ἰλὺν καὶ ψάμμον...

[288] Λιθιῶσι δὲ μάλιστα ἄνθρωποι, καὶ ὑπὸ νεφριτίδων καὶ στραγγουρίης ἁλίσκονται καὶ ἰσχιάδων, καὶ κῆλαι γίγνονται, ὅκου ὕδατα πίνουσι παντοδαπώτατα καὶ ἀπὸ ποταμῶν μεγάλων, ἐς οὓς ποταμοὶ ἕτεροι ἐμβάλλουσι, καὶ ἀπὸ λίμνης, ἐς ἣν ῥεύματα πολλὰ καὶ παντοδαπὰ ἀφικνεῦνται, καὶ ὁκόσοι ὕδασιν ἐπακτοῖσι χρέονται διὰ μακροῦ ἀγομένοισι, καὶ μὴ ἐκ βραχέος. Οὐ γὰρ οἷόν τε ἕτερον ἑτέρῳ ἐοικέναι ὕδωρ, ἀλλὰ τὰ μὲν γλυκέα εἶναι, τὰ δὲ ἁλυκά τε καὶ στυπτηριώδεα, τὰ δὲ ἀπὸ θερμῶν ῥέειν· ξυμμισγόμενα δὲ ταῦτα ἐς ταὐτὸν ἀλλήλοισι στασιάζει, καὶ κρατέει αἰεὶ τὸ ἰσχυρότατον.

This author attributes the cause of stone in the bladder, strangury, and sciatica to the drinking of mixed waters that leave a sediment in the veins. Strangury and sciatica are particularly associated with a stiffening effect which we may assue is caused by the solid mass of earth in the vessels and in the urinary tract solidifying and restricting the movements of the body and of the fluids in the body. The formation of stone in the bladder is explained in *Airs, Waters, Places* as a gathering and solidification of the earthy matter in the urine.[289] Again, the author of *Aphorisms* states that sediment can be found in the urine and this can be a sign of bladder stones:[290]

> When the urine contains a sandy sediment there is stone in the bladder. [291] (Hippocrates, *Aphorisms* IV, 79 Jones =L4.530.12 [79])

This dry, earthy part of fluids is separated out when heated by the sun in the natural world and by the body's natural heat or internal heat caused by disease such as fever. When this occurs in the human body, diseases such as bladder stone or an increased amount of sand in the fluids occurs. [292] For example, the author of *Epidemics* 6 asks:[293]

> Sedimentation after urination is more frequent in children. Is it because they are warmer? [294] (Hippocrates, *Epidemics*, 6.3.7 Smith=L5.296.3-4 [6.3.7]) [295]

[289] Hippocrates, *Airs, Waters, Places,* 9, 25-37 Jones =L2.38.13-21.
[290] Craik places *Aphorisms* at 400BC making it roughly contemporary with *Airs, Waters, Places,* which dates from mid-late fifth century BC: (2015) 11 and 34.
[291] Ὁκόσοισιν ἐν τῷ οὔρῳ ψαμμώδεα ὑφίσταται, τουτέοισιν ἡ κύστις λιθιᾷ.
[292] See above p.45.
[293] Craik dates this treatise to about 400BC making it roughly contemporary with *Airs, Waters, Places* and *Aphorisms.* See n. 290 above.
[294] Τὸ μετ' οὔρησιν σύναγμα, παιδίοισι μᾶλλον· ἦρ' ὅτι θερμότερα; The word σύναγμα is used in this text to denote a collection or concretion of material, which the LSJ suggests has connotations with stone or gravel. LSJ s.v. σύναγμα.

Here, it may be assumed that the warmer bodies of children attract moisture from the fluids leaving the dry, earthier part behind. In *Airs, Waters, Places,* the earthiness and the heating effect of hot waters dries the body out. Indeed, this is not necessarily a bad thing for some constitutions since some people have bellies that are 'soft, moist and phlegmatic' which benefit most from waters that dry such as saline waters. The stiffening and drying effect of earth in the body could also benefit a person who has a particularly moist constitution and so could be beneficial to the internal organs. This effect was produced by drinking waters heavy in earthy sediment such as sea waters. On the other hand, some constitutions have digestive organs that are 'hard and easily heated' and benefit from 'sweet' and light waters.[296] If a person suffered from dry internal organs, this type of light and sweet water that was not heavy in sediment was needed to moisten their bodies. We may assume that waters were called 'light' because they did not have much sediment in them and 'sweet' because sediment could be salty. The lack of an earthy part to these waters made them moist rather than dry making them good for people whose internal organs were particularly dry, stiff, or hard.

This process where sediment in the bodily fluid builds up and solidifies in the passageways or blocks the free movement of liquid can be compared to the silting process in the natural world. In the river, the fluid motion of the water becomes less and less as it dries up and the river is blocked by earthy matter. In the human body, the sediment solidifies in the veins causing stiff and restricted movements or it coalesces into a stone that restricts the flow of fluids. Indeed, we may also compare this to a process in the natural world where hot waters are usually earthy or hard in

[295] In *Airs, Waters, Places* and *Aphorisms,* and *Epidemics* sand is left in the vessels suggesting a popular line of thought in these medical treatises where sand is transferred from the waters into the bodily fluids and organs. And see above for sand and mud in veins: p.45.
[296] Hippocrates, *Airs, Waters, Places,* 7, l.84-90 Jones=L2.32.3-8.

nature because they have been heated by the different earths that they run through. For example, in *Airs, Waters, Places,* waters that spring from rocks or that have passed through earth that contains different metals or other natural earthy deposits, are hard and heating causing ailments such as constipation which is associated with this dryness brought on by heat.[297] In the warm body of a child, fluids are earthier because they are running through a warm being with a strong internal heat and this causes moisture to be drawn from the fluids leaving the earthier part behind and leaving the child prone to diseases such as bladder stones.

Earth in the bodily fluids can have a detrimental effect if it builds up too much or if the more watery part of the fluid is taken away by heat leaving the heavier, earthy sediment behind. Stones that are formed in the body and the stiffening of the internal organs can cause diseases such as sciatica where the material solidifies. In the same way, the process of silting has a detrimental effect on the river blocking or restricting its movements. Once a person has consumed river water that is heavy in sediment, the veins become blocked imitating the nature of the river from which the person drank.

In terms of using different waters to cure ailments, certain types of water could have both helpful and harmful effects depending on the constitution of the person. Like the waters used on the exterior of the body, the waters opposite in nature to the ailment must be used to temper the excess. Again, the ancient physicians are applying what they observe in the natural world to the human body in order to cure ailments because the body imitates the natural world. By drinking

[297] Hippocrates, *Airs, Waters, Places,* 7, l.49-68 Jones =L2.28.22-30.12.

waters heavy in sediment the body stiffens and dries, by drinking waters that are light and moist free from an abundance of earthy admixture the body is moistened.

Aside from these waters which can be detrimental to one person's health and good for another person's health, there is a distinction made between waters that are generally healthy and those that are unhealthy for all constitutions based on attitudes and beliefs about certain types of water that can be found primarily in religious beliefs. These waters have associations with life and death respectively and the processes occurring in the natural world that these waters undergo are reflected in the human body producing effects that are beneficial or detrimental to health.

2. Healthy and unhealthy waters

The treatise that most comprehensively describes the effects of different types of waters found in the natural world is *Airs, Waters, Places.* By comparing this treatise to theories found in Aristotle's *Meteorology* about the nature of waters we may shed new light on why certain waters induced growth and health and why others promoted disease and caused death. First, we must establish the nature of healthy and unhealthy waters as two opposing forms of water. Healthy water is generally sweet, light, and flowing originating from deep pools and springs in the mountains whereas unhealthy water brings much disease, is murky, heavy and stagnant as well as shallow as is often found in marshes. In *Airs, Waters, Places*, the light, sweet, flowing waters with a good aspect are described as 'purified' by the sun whereas

stagnant waters enveloped by mist and subject to many rains are 'putrefied' by the sun.[298]

In mythology and religious cult, the healthiest waters were also springs and flowing waters that were home to a nymph or a river god who could induce fertility or growth in both the land and the human body whereas unhealthy waters were associated with death, disease and a gateway to the underworld. These two different systems of thought offer different explanations for why one set of waters is healthy and another unhealthy but there are striking similarities found between mythological ideas and medical or philosophical ideas about healthy and unhealthy waters.

Healthy waters

According to the Hippocratic treatise *Airs, Waters, Places,* healthy waters were generally found in places where water was flowing or that flowed from mountain springs and which received enough heat from the sun to purify the land's waters. In this treatise, the description of waters that face the east describes how the sun purifies the water when it shines on it for a prolonged period of time because the sun acts on it from the moment of its rising.[299]

It is not explained how the sun purifies these waters but the description suggests that the heat filters through into the waters throughout the day and purifies them by heating them. I suggest that the heat of the sun within these waters separates out the muddier part but the sweeter part is not taken away because the heat itself is within the water.[300] This is through a boiling process or a process similar to this where the heat of the sun has filtered through the water completely. This process

[298] Hippocrates, *Airs, Waters, Places,* 5, l.10-19, 15, l.10-12 Jones =L2.22.20-24.2, 60.15-16.
[299] Hippocrates, *Airs, Waters, Places,* 5, l. 11-15 Jones=L2.22.21-24.
[300] This purification by separation can be associated with the idea that purification is a process of separation for the ancient Greeks particularly in religious cult. See Parker (1983) 18-31.

normally occurs in the atmosphere once the sweeter part of water has been drawn up by the sun. Once in the atmosphere, the sweeter part of the water is then once again separated out from what heavier part has remained in it and the sweet, light part undergoes concoction (ἕψω).[301]

According to Aristotle boiling (ἕψησις) is a species of concoction (πέψις) and is a process that makes moisture more perfect or pure.[302] Concoction is a process whereby the natural heat of an object perfects the matter of any given object.[303] For Aristotle boiling is a process that brings something to a state of completion through the perfection of its matter.[304] For example, Aristotle maintains that concoction is a process completed by the natural or innate heat of something whereby the matter and moisture of the body is mastered and determines its proper nature:

> Concoction ensues whenever the matter, the moisture, is mastered. For the matter is what is determined by the natural heat in the object, and as long as the ratio between them exists in it a thing maintains its nature.[305] (Aristotle, *Meteorology*, IV, 2 379b33-4)

A similar process of concoction may also be observed occurring in the body during digestion where food is separated by heat into the sweeter part and the heavier waste when digestion takes place:

> ...the food when it enters the body is sweet, yet the residuum and dregs of liquid food are found to be bitter and salt. This is because the sweet and drinkable part of it has been drawn away by the natural heat and has passed

[301] Hippocrates, *Airs, Waters, Places*, 8, l.28-35 Jones=L2.34.13-18.
[302] Aristotle, *Meteorology*, IV, 2 379b12.
[303] Aristotle, *Meteorology*, IV, 2 379b18-20.
[304] Aristotle, *Meteorology*, IV, 3 381a26-7.
[305]Συμβαίνει τοῦτο πάσχειν ἅπασιν, ὅταν κρατηθῇ ἡ ὕλη καὶ ἡ ὑγρότης· αὕτη γάρ ἐστιν ἡ ὁριζομένη ὑπὸ τῆς ἐν τῇ φύσει θερμότητος. ἕως γὰρ ἂν ἐνῇ ἐν αὐτῇ ὁ λόγος, φύσις τοῦτ' ἐστίν.

into the flesh and the other parts of the body according to their several natures.[306] (Aristotle, *Meteorology,* II, 2 355b8-11)

What heat fails to overcome becomes excrement in animal bodies...[307] (Aristotle, *Meteorology,* II, 3 358a13-14)

The heat of the body concocts food and turns it into blood according to Aristotle[308] and blood causes motion flowing to all parts of the body to aid growth since the blood is the 'material out of which the whole fabric is made.'[309]

If we apply these theories to the ideas of growth associated with the different waters in Hippocratic texts, we can see why some people grow better than others do and why they reflect the land in their growth since the waters are nourishing both the land and the people. It could be suggested that by drinking waters that are sweetened by the sun, growth ensues because the sweeter part of the water is similar to the moist nutriment drawn from food by the body, which has been concocted.[310] Indeed, moisture was believed to nourish everything and to be the 'vehicle of nutriment' in

[306] καὶ γὰρ ἐν τούτοις τῆς τροφῆς εἰσελθούσης γλυκείας ἡ τῆς ὑγρᾶς τροφῆς ὑπόστασις καὶ τὸ περίττωμα φαίνεται πικρὸν ὂν καὶ ἁλμυρόν· τὸ γὰρ γλυκὺ καὶ πότιμον ὑπὸ τῆς ἐμφύτου θερμότητος ἑλκυσθὲν εἰς τὰς σάρκας καὶ τὴν ἄλλην σύνταξιν ἦλθεν τῶν μερῶν, ὡς ἕκαστον πέφυκεν.
[307] οὗ γὰρ ἂν μὴ κρατήσῃ τὸ θερμόν, ἐν μὲν τοῖς σώμασι γίγνεται περίττωσις.
[308] Aristotle, *Meteorology,* IV, 2 379b23-5; *On Sleep,* 2 456a32-4; *Parts of Animals* II, 3 650a2-36. Lennox provides three arguments for this namely: (1) blood vessels are containers and containers in the body according to Aristotle are for residues and nutrients. Blood is not a residue so it must be a nutrient. (2) there is as much blood in the body as there is food ingested (3) there can be diseased blood that corresponds to bad food and there is healthy blood that corresponds to wholesome food. See Lennox (2001) 199-200 650a32-5. For further discussion of concoction in digestion and growth see Freudenthal (1995) 23. Again, in Plato's *Timaeus,* it is the fire in the body that separates the foods and fills the veins with nutriment: Plato, *Timaeus,* 80d and see Freudenthal (1995) 21. See also Lloyd (1996) 83-103.
[309] Aristotle, *Parts of Animals,* III, 5 668a14-22; cf. *Parts of Animals,* II, 4 651a12 and Lennox's commentary which shows how this claim is dependent on the syllogism: nourishment is matter, blood is the final stage of nourishment therefore blood is matter. Lennox (2001) 203 651a12. Furley and Wilkie (1984) 21.
[310] Also, in order to make rain water sweet and at its best one must boil it (ἀφέψεσθαι) according to this treatise: *Airs, Waters, Places,* 8, l.49, Jones=L2.36.4. So the boiling process is purifying waters which can be compared to the action the sun has on the waters.

some Hippocratic texts.[311] In *Airs, Waters, Places,* the people who drink light and sparkling waters are 'tall' and 'well-built' with 'blooming complexions' such as those who live in an east-facing city or those who live in Asia.[312] Therefore, the quality of waters were important for the nature of growth in a human body since they played a key role in its nourishment.

In relation to this, the effect of water on the menstrual blood and therefore on fertility is also great because waters are so important for growth. Where the micro-/macrocosm is concerned, the menstrual blood has strong parallels with the earth and its ability to provide matter from which life can grow.[313] The menstrual blood must be of a good condition to receive the seed in the womb and allow it to grow and develop. A woman drinking waters that have been purified by the sun will be affected by those waters in her menstrual fluid making the blood of a good condition. In *Airs, Waters, Places,* women in the east and in the east-facing city conceive and give birth easily which is partly due to the sweet waters they drink, which have been purified by the sun making them healthier.[314]

Waters flowing from high places were also thought to be some of the best waters according to the author of *Airs, Waters, Places* and springs and rivers often had their origins in the mountains for the ancient physician or philosopher. [315] A parallel to this can be found in attitudes and beliefs regarding different waters found in ancient religious cult during this time period. In this thought system, mountain water and springs found on the mountain were particularly associated with life and

[311] Hippocrates, *On Regimen* I, 3, l.8-10 Jones =L6.472.17-18*; On Nutriment,* 55 Jones=L9.120.3 (55).
[312] Hippocrates, *Airs, Waters, Places,* 5, l.17-19 Jones = L2.22.25-24.2 and 12, l.35-38 Jones =L2.54.15-17.
[313] See above pp.67-8.
[314] Hippocrates, *Airs, Waters, Places,* 5, l.11-28 Jones =L2.22.21-24.9.
[315] Aristotle, *Meteorology* I, 12 350a2-3*;* Hippocrates, *Airs, Waters, Places,* 7, l.58-9 Jones =L2.30.5-6.

fertility. A good example of this is the shrine to Aphrodite on Mount Hymettus, which is home to a spring of the Ilissus River, the water from which was believed to make barren women fertile and bring about easy births.[316] Indeed, flowing rivers and certain springs had the power to bring fertility to women as demonstrated by the important use of water in the community in Athens during sacred rites to do with marriage, fertility and children. For example, the bride-to-be bathed in sacred spring water before marriage and the nymphs were the deities who presided over the marriage or betrothal.[317] In addition, when a new baby was born the mother and her new born would bathe in sacred spring water to wash away the pollution caused by the birth.[318] The nymphs were the deities who would watch over the new born child.[319] Once the child reached adolescence, a lock of hair was offered to the river deity associated with the child's birth.[320]

There is a link to mountains and their association with fertility since rivers were observed to flow from mountainous regions and springs were found on the mountain heights.[321] Deities found on the mountain were often associated with fertility. For example, Zeus was sometimes worshipped as an agrarian deity and a fertility god in connection to his role as a rain god.[322] Moreover, there are links to Artemis as a deity often found on the mountain heights and as a deity who watches over childbirth and children.[323] Nymphs were also strongly connected to fertility

[316]Cratinus F110 (102) in PCG; Garland (1990) 38; Dunant (2008) 91.
[317] Garland (1990) 220.
[318] Garland (1990) 74, 220.
[319] Garland (1990) 83; Larson (2001) 111.
[320] Homer, *Iliad*, 23.141-49; Parker (2011) 76.
[321] There is a particular emphasis on rivers originating on mountain tops in the ancient physicians and philosophers investigated in this thesis. This emphasises the links between river water at the beginning of its course being particularly associated with fertility: see Pp.101-2 above. See Crouch for the discovery of dolines: Crouch (2004) 113.
[322] Langdon (1976) 79-81; Sanctuaries to Zeus Meilichios are described by Cook (1925) 1114 where he may be a fertility god on the Hill of the Nymphs in Attica; Hesiod, *Works and Days*, 465-7.
[323] Morizot (1994) 201-8; for examples of Artemis' shrines on mountain heights and near rivers see Brulotte (2002) 179-81.

particularly in their association with springs since they were the origin of rivers.[324] Nymphs that dwelled on the mountains were called daughters of Zeus possibly because mountain springs were thought to be augmented by rain waters.[325] This suggests a connection between the fertilising powers of Zeus as a rain god and agrarian deity and the fertility powers of the nymphs and the rivers.[326]

Indeed, the role of Zeus as an agrarian deity and his connection to the nymphs and the river gods is significant when we consider the role of water in fertilising the land. As we saw in the previous chapter, rain falling from the heavens fertilised the earth causing all forms of life to grow.[327] Since nymphs are the daughters of Zeus this suggests that the springs they inhabit are formed from rain water and possess the same fertilising powers as the rain. Moreover, flowing rivers such as Okeanos and Achelous were male deities and local rivers often had a male river god associated with them who brought fertility to the land and its people.[328]

These views found in ancient religion and cult practices where flowing water from high places such as the mountains brings fertility and life can be seen reflected in the views of physicians and philosophers. For them, the waters were purified by the sun and kept pure and healthy by their flowing nature rather than by a deity or nymph. These flowing waters descending from the mountain tops were augmented by the sweet and light rain water purified by the sun and produced fertility and health in the land and in the humans that consumed them. Growth was particularly abundant in both the natural environment and in the human body emphasising a micro-/macrocosm model where the human body is working in the same way as the

[324] Garland (1990) 38-9; Larson (2001) 111; Parker (2011) 75.
[325] Aristotle, *Meteorology,* I, 12 350a5-13.
[326] It is also interesting that Kephalos calls for Nephele whose name means cloud on a mountain top: Pherecydes FGrHist Fr34 p.71 suggesting that the river is augmented by rain water. Fowler (1993) 29.
[327] See above pp.63-4.
[328] Homer, *Iliad*,18,607-9; Euripides, *Bacchae,* 625;Cole (2004) 22; Larson (2001) 99.

land since the healthier water is having the same effect on the body as it is on the natural environment.

Unhealthy waters

The unhealthiest type of waters according to *Airs, Waters, Places* came from marshes which were stagnant and subject to much rainwater flowing into them with no outflow.[329] They caused much disease as a result of their nature all year round. There is a connection here with cult associated with Herakles. Herakles had shrines dedicated to him where he sometimes had the epithet '*Alexikakos'* suggesting he 'averted evil' and abolished plague.[330] The fact that he also drained swamps meant that Herakles was eradicating a source of disease as a healing god.[331]

The treatise *Airs, Waters, Places* maintains that rain water, though it is the sweetest after concoction in the atmosphere, grows foul most quickly due to its mixed nature and needs to be boiled if disease is to be avoided.[332] Mixed water from many sources is generally not healthy because it contains a great amount of sediment and both rain water and river water are of this nature. The sun also putrefied these

[329] Hippocrates, *Airs, Waters, Places*, 7, l.6-12 Jones=L2.26.12-16; see also Aristotle, *Meteorology*, I, 14 353a1-6.
[330] For his epithet Alexikakos: Aelius Aristides 40.15 (Behr transl.): Behr (1981) 241; for the sanctuary to Herakles at Melite where he is referred to as *Alexikakos* and a heaing god: scholia in Aristophanem: Ranas (501 a-d) and see Salowey (2002) 172 for archaeological evidence.
[331] Salowey (2002) 171-75. For a discussion of the myth of the Hydra and its possible link to the marshes at Lerna that Herakles may have drained see Salowey (2002) 175 and for Herakles draining marshes: Diodorus Siculus 4.18.6.
[332] Hippocrates, *Airs, Waters, Places*, 8, l.3-51 Jones=L2.32.18-36.6. Rain water in healthy waters is prevented from putrefying because the water is in motion and is purified by the sun, rain water that has been caught and is still must be boiled to purify it. Here, the boiling process used to purify waters that usually occurs in the atmosphere when it has been drawn up by the sun can be performed by mankind. Mankind is using his skill in order to purify water making it safe to drink. Aristotle states that 'art in some cases completes what nature cannot bring to a finish, and in others imitates nature.' *Physics*, II, 8 199a15-17. It could be argued that by imitating the process occurring in the natural environment through his skill, mankind is acting as a microcosm. This is true when one considers the micro-/macrocosmic relationship between the mind of mankind and the demiurge in Plato. But the concept of the universe possessing mind or intelligence comparable to a man's is something that is not explicitly discussed in the Hippocratic Corpus and something for which there is not enough evidence for in Hippocratic theories. As such, a man's skill in comparison to an intelligent universe does not come into the micro-/macrocosm model in these texts.

waters rather than purified them according to *Airs, Waters, Places*.[333] Indeed, the lack of outflow in marshes and lakes allows the waters to become putrefied. Aristotle discusses how anything that is not in motion is more likely to putrefy than something that is in motion:

> So too anything that is flowing or in motion is less apt to putrefy than a thing at rest; for the motion set up by the heat in the air is weaker than that pre-existing in the object, and so it causes no change.[334] (Aristotle, *Meteorology,* IV, 1 379a33-379b1)

Thus, though large rivers can have mixed waters flowing into them, the fact that they are flowing and not allowed to stagnate makes them healthier to drink.

For the author of *Airs, Waters, Places,* stagnant waters such as marshes and lakes are particularly unhealthy sources of water for the inhabitants of the land around them. For example, the people who live on the Phasis are described as fleshy and lazy and they reflect the slow-moving river they live on.[335] They also have a 'gross habit of body' and have a yellowish complexion.[336] In a place that has good waters, the plants and the animals all grow well but the fruits in a marshy place such as the Phasis are stunted, flabby and do not ripen, a description that can be compared to the human inhabitants who feed off and reflect this land.[337]

This treatise describes the waters of the Phasians as 'putrefied' (σηπεύω) by the sun and mist and fog envelops the land on the Phasis. [338] Earlier on in the same

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[333] Hippocrates, *Airs, Waters, Places,* 15, l.10-12 Jones =L2.60.14-16.
[334] ὁμοίως δὲ καὶ τὸ κινούμενον καὶ ῥέον ἧττον σήπεται τοῦ ἀκινητίζοντος· ἀσθενεστέρα γὰρ γίγνεται ἡ ὑπὸ τῆς ἐν τῷ ἀέρι θερμότητος κίνησις τῆς ἐν τῷ πράγματι προϋπαρχούσης, ὥστε οὐδὲν ποιεῖ μεταβάλλειν.
[335] Hippocrates, *Airs, Waters, Places,* 15, l.13-14, 18-22 Jones=L2.60.16-17, 60.20-62.3.
[336] Hippocrates, *Airs, Waters, Places,* 15, l.20-24 Jones=L2.62.2-4.
[337] Hippocrates, *Airs, Waters, Places,* 12 and 15 Jones =L2.52.10-56.6, 60.9-62.12.
[338] Hippocrates, *Airs, Waters, Places,* 15, l.10-12 Jones =L2.60.15-16.

treatise, a city is described with a westward orientation where the mist dissolves into the waters making them unhealthy because the sun does not shine on the waters long enough to clear them, we may assume that the same is the case for the Phasians.[339]

Here, if we apply the idea suggested above where the sun purifies through a boiling process, the water is not purified by the sun as with the healthy waters because the sun is not shining on them long enough to cause the concoction. Instead, only the sweet part of the water is taken away by the sun leaving the earthy part behind because the sun does not have time to filter through the waters completely and cause the purification within the waters themselves. Since this water is not subject to concoction we may assume that it is detrimental to growth because the blood does not benefit from the nourishment that promotes growth properly hence why the Phasians are fleshy and have a yellowish complexion.[340]

Hippocratic physicians associated marsh water with disease and illness and offered natural explanations as to why the human body might suffer disease when it consumed marsh water. Though there is an abundance of water and moisture in marshland, the water itself is a dry type of water because the finest and lightest part is drawn from these shallow pools, which leaves these waters with a greater amount of dry sediment relative to those waters from deep pools which have a greater amount of water. Indeed, Aristotle describes the process of putrefaction as ultimately a drying process in book four of his *Meteorology*.[341] Therefore, the description Aristotle gives of putrefaction as ultimately a drying process can be applied to the effect that heat has on these waters in the Hippocratic Corpus.

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[339] Hippocrates, *Airs, Waters, Places*, 6, l.6-10 Jones =L2.24.13-16; 15, l.17-18 Jones =L2.60.19-20. For a discussion of the sun's effects on waters see pp.99-100.
[340] Cf. the discussion of inhabitants in a west facing city that do not get enough sunshine but are scorched by the sun p.164.
[341] Aristotle, *Meteorology*, IV, 1 379a2-11.

The Hippocratic *Airs, Waters, Places* states that when consumed marsh waters brought on conditions associated with stiffness such as 'large, stiff spleens' and 'very dry and very hot' digestive organs. These symptoms are associated with earthy sediment in the body solidifying and stiffening the insides, which in turn causes a dryness in the body.[342] Again, the inhabitants are attacked by 'long quartan fever' and 'ardent fever' and fevers are generally associated with dryness in the body.[343]

Also, according to *Airs, Waters, Places* these waters grow hot and cold easily and so change with the seasons; they are hot in the summer and cold in the winter as opposed to healthy waters, which are cold in summer and hot in the winter.[344] The author of *Aphorisms* discusses how some waters conduct heat. He explains that the finest and lightest water, which is usually associated with rain water in the Hippocratic Corpus and which fills marshes, becomes hot and cold very easily:

> The water is lightest which quickly gets hot and quickly gets cold.[345]
>
> (Hippocrates, *Aphorisms* V, 26 Jones =L4.542.1-2 [6])

Hence, the temperature change brought on by the seasons has a profound effect on these waters because they change in temperature so easily.

The diseases produced by drinking waters that are hot in summer and cold in winter are listed by the author of *Airs, Waters, Places*. The diseases in the summer for people who drink these waters are as follows:

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[342] Hippocrates, *Airs, Waters, Places*, 7, l.15-23 Jones =L2.26.18-28.3 See above for further discussion pp.92-97.
[343] Hippocrates, *Airs, Waters, Places*, 7, l.27-35 Jones =L2.28.5-11 See pp.155-161.
[344] Hippocrates, *Airs, Waters, Places*, 7, l.7-15 Jones =L2.26.12-18.
[345] Ὕδωρ τὸ ταχέως θερμαινόμενον καὶ ταχέως ψυχόμενον, κουφότατον.

> For in the summer there are epidemics of dysentery, diarrhoea and long quartan fever, which diseases when prolonged cause...dropsies that result in death. These are their maladies in summer.[346] (Hippocrates, *Airs, Waters, Places,* 7, 2.200.12-16 Jouanna=L2.28.5-9)

In the summer, the diseases here are associated with an excess of moisture and heat. For example, diseases such as dysentery, diarrhoea and dropsies are listed which can be associated with an excess of moisture in the body. I suggest that the hot water enters the body and draws moisture to itself causing diseases associated with moisture. Indeed, these diseases can be compared to those found in the city facing the south towards the hot winds where the waters are described as hot in the summer and cold in the winter. In this city, dysentery and diarrhoea are mentioned as endemic diseases as well as many phlegmatic fluxes.[347]

The ailments caused by marsh waters in winter, are associated with a hardening of the body and the diseases that have a dry character such as fever, which is generally brought on by dryness in the body:[348]

> In winter young people suffer from pneumonia and illness attended by delirium, the older, through the hardness of their digestive organs, from ardent fever.[349] (Hippocrates, *Airs, Waters, Places,* 7, 2.200.16-201.2 Jouanna=L2.28.9-11)

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[346] τοῦ γὰρ θέρεος δυσεντερίαι τε πολλαὶ ἐμπίπτουσι καὶ διάῤῥοιαι καὶ πυρετοὶ τεταρταῖοι πολυχρόνιοι· ταῦτα δὲ τὰ νοσεύματα μηκυνθέντα τὰς τοιαύτας φύσιας ἐς ὕδρωπας καθίστησι καὶ ἀποκτείνει. Ταῦτα μὲν αὐτέοισι τοῦ θέρεος γίγνεται·

[347] Hippocrates, *Airs, Waters, Places,* 3, l.10-13 and l.23-4 Jones =L2.16.5-7, 18.5-6.

[348] For fevers see p.157.

[349] τοῦ δὲ χειμῶνος, τοῖσι νεωτέροισι μὲν περιπλευμονίαι τε καὶ μανιώδεα νοσεύματα· τοῖσι δὲ πρεσβυτέροισι καῦσοι, διὰ τὴν τῆς κοιλίης σκληρότητα.

These waters can be compared to waters that are frozen since frozen waters also have a dry nature. By comparing these two types of waters we can see how the marsh waters that are described as 'frosty, cold and turbid through snow and frosts' take on this nature:

> Waters from snow and ice are all bad. For once frozen, water never recovers its original nature, but the clear, light, sweet part is separated out and disappears, while the muddiest and heaviest part remains...freezing dries up and causes to disappear the lightest and finest part, not the heaviest and coarsest, to do which it has no power. In this way, therefore, I am of the opinion that such waters, derived from snow or ice, and water similar to these, are worst for all purposes. [350] (Hippocrates, *Airs, Waters, Places*, 8, 2.207.7-208.9 Jouanna =L2.36.6-19)

Here, the drying process that happens in putrefaction can be compared to the freezing process since the water is putrefied by freezing where it contains more of the heavier, drier, earthy material.

The waters derived from snow and ice have a particular abundance of the heavier, darker part of water. Indeed, these waters began as rain water that has many impurities as it has been drawn from many different places. The effect of freezing removes any clear part that the water may have possessed and leaves the heaviest, coarsest parts. Thus, the cold acting on water by freezing it has a separating effect in this Hippocratic treatise. By freezing the water, the best part is separated off but the

[350] Τὰ δὲ ἀπὸ χιόνος καὶ κρυστάλλων πονηρὰ πάντα· ὁκόταν γὰρ ἅπαξ παγῇ, οὐκ ἔτι ἐς τὴν ἀρχαίην φύσιν καθίσταται, ἀλλὰ τὸ μὲν αὐτέου λαμπρὸν καὶ κοῦφον καὶ γλυκὺ ἐκκρίνεται καὶ ἀφανίζεται, τὸ δὲ θολωδέστατον καὶ σταθμωδέστατον λείπεται…ὑπὸ τῆς πήξιος ἀφανίζεται καὶ ἀναξηραίνεται τὸ κουφότατον καὶ λεπτότατον, οὐ τὸ βαρύτατον καὶ παχύτατον· οὐ γὰρ ἂν δύναιτο. Ταύτῃ οὖν νομίζω πονηρότατα ταῦτα τὰ ὕδατα εἶναι τὰ ἀπὸ χιόνος καὶ κρυστάλλου, καὶ τὰ τουτέοισιν ἑπόμενα, πρὸς ἅπαντα χρήματα. Περὶ μὲν οὖν ὀμβρίων ὑδάτων καὶ τῶν ἀπὸ χιόνος καὶ κρυστάλλων οὕτως ἔχει.

heavier, coarser part forms the snow and ice within the clouds and when this falls into waters it destroys their clarity.

Moreover, the people who drink this water age prematurely according to this author.[351] This could be due to the drying effect of the water that are heavy in earthy sediment since old age was often associated with dryness.[352] Another parallel can be drawn between the body and the earth here since the drying up of rivers was believed to be the earth becoming 'older.'[353] When waters begin to reach the end of their course, their flow slows down and they gather in lakes or in stagnating marshes. These types of waters were considered particularly unhealthy and had associations with death, premature aging and disease. Indeed, it could be argued that the water in these stagnant pools is returning to the earth here since the river has come to the end of its life in a similar way to the human body returning to the earth when it has died.

These associations with death and old age in the micro-/macrocosm can be found articulated through myth. Marsh-land had particular associations with death and the underworld where the river was returning to the earth in ancient thought. Murky, stagnating lakes or marshes were sometimes considered to be a passage to the underworld. For example, the cult of Dionysus in the marshes in Attica was possibly a chthonic cult and a passage to the underworld.[354] Again, at Lerna, Pausanias tells of a gateway to the underworld in the 'bottomless' Alcyonian lake where men would be pulled under if they tried to swim across.[355] In addition, as Ogden points out, though the Acheron is often referred to as a river, there is some

[351] Hippocrates, *Airs, Waters, Places*, 7, l.42-4 Jones =L2.22.7-9.
[352]Odysseus' skin is dried up by Athena when he is turned into an old man: Homer, *Odyssey*, 13, 397-8; Aristotle, *Meteorology*, IV,1 379a2-4; Lloyd (1966) 45. It should be noted, however, that the author of *On Regimen* I is an example of a rare occasion where the elderly are referred to as moist in their constitution: Hippocrates, *On Regimen* I, 33, l.18-21 Jones =L6.512.11-12.
[353] Aristotle, *Meteorology*, II, 14 351a19-35.
[354] Dunant (2008) 36-7.
[355] Paus. 2.37.5-6.

ambivalence as to its actual nature since it is both a river and a lake, or a sort of stagnant off-flow from a river.[356] Marshes and swamps could sometimes be associated with Artemis who was more often considered to be a deity associated with life, childbirth, fertility and the mountain suggesting that marsh water still had associations with life.[357] This suggests that the water itself was between life and death since it was life-giving in that it could sustain mankind but a human body would not live for very long from it and would age prematurely.

According to *Airs, Waters, Places,* in a place where the inhabitants are drinking marsh waters the women have difficulty with both birth and conception, which is not surprising since the waters are so strongly connected with death.[358] There is a particular emphasis on how swollen the baby is once it is born and how women become so swollen that it looks like they are pregnant but they are actually suffering from dropsy in the womb.[359] Indeed, the excess of moisture in a place such as this where there is heavy rain, mist and water that is not drained from the surface of the land not only causes excess moisture in the natural environment but also in the human body. The dropsy in the womb and swollen nature of the body suggests an excess of moisture and in other Hippocratic treatises an excess of moisture can cause barrenness in women. Marsh-land can be compared to a city exposed to the hot south winds where the waters are described as 'plentiful,' 'brackish' and 'near the surface'. Here, women are barren through disease and many babies are lost during pregnancy.[360] This abundance of moisture makes the inhabitants particularly moist

[356] Aeschylus, *Psuchogogoi*, F273a l.10-13; Ogden (2001) 45-6.
[357] Morizot (1994) 203; Brulotte (2002) 182.
[358] Hippocrates, *Airs, Waters, Places,* 7, l.35-37 Jones =L2.28.11-13.
[359] Hippocrates, *Airs, waters, Places,* 7, l.37-48 Jones =L2.13.21.
[360] Hippocrates, *Airs, Waters, Places,* 3, l.8-9 and l.18-21. It could be argued that the water here is also very dry since it is 'brackish' which would contribute to barrenness since the blood could be dried up or even constricted by the silting up of the veins as we saw above (pp.92-7) but the emphasis here is on the abundance of moisture rather than on the dryness that water might bring.

and phlegmatic according to this treatise.[361] Indeed, the women have 'excessive fluxes' and are generally unhealthy in this city.[362] The excess moisture we may assume is what causes such women to be barren since the womb is too moist. We can compare this idea to the treatise *On Barrenness* where the author discusses women who cannot conceive and how this infertility might be treated. In one case, he mentions that a woman's menstrual fluid can be too moist and this prevents conception:

> ...her menses are passing in a greater amount than they should and too moist, so that her own contribution to gestation is not taken up, and the seed coming from her husband decomposes.[363] (Hippocrates, *On Barrenness,* 29 Potter =L8.454.7-10 [241])

Here, the moisture in a woman's womb prevents conception since the material she provides is too moist and passes out of her so that not enough is left for conception and the male seed is destroyed. The author goes on to suggest that the woman should undergo 'drying' as part of her cure.[364]

Unhealthy water in the Hippocratic Corpus is stagnant and generally associated with marsh water which has no outflow and contains an abundance of rain water. Indeed, there is an abundance of water in marsh lands since it sits on the surface of the land but the water itself is dry in nature since it is putrefied by the sun. The inhabitants imitate this natural environment where they are flabby and moist but the diseases that are suffered are associated with the dry. Marsh-dwellers age prematurely because of this drying nature of the waters and have difficulty with

[361] Hippocrates, *Airs, Waters, Places,* 3, l.10-13 Jones =L2.16.4-5.
[362] Hippocrates, *Airs, Waters, Places,* 3, l.18-21 Jones =L2.18.1-4.
[363] τὰ ἐπιμήνια πλείω γίνεται τοῦ προσήκοντος καὶ ὑγρότερα, ὥστε τὸ ἀπὸ τῆς γυναικὸς μὴ ξυλλαμβάνεσθαι πρὸς τὴν τέκνωσιν, τήν τε τοῦ ἀνδρὸς γονὴν ἐπιοῦσαν διαφθείρεσθαι.
[364] Hippocrates, *On Barrenness,* 29 Potter =L8.456.5-6.

fertility and births. They also suffer from diseases associated with both dryness and gross excess in both heat and cold because the waters do not temper the nature of the seasons. The body reflects the natural environment in its unhealthy nature as an environment associated with death and old age as well as with a lack of balance.

Where the river is at the beginning of its course it is fast-flowing, sweet, and light but it slows as it reaches the end of its course and eventually turns to marsh water stagnating and full of sediment as it returns to the earth. The human life cycle parallels the river's life cycle where the body is born of the earth and returns to the earth when it dies. This can been seen in the effects of the waters (and the varying amounts of earth contained in them) that are produced on the human body. Those that drink waters that are flowing and at the beginning of their life grow well and are healthier and more fertile than those who drink stagnating waters at the end of the water's life when it contains a large amount of sediment as it returns to the earth. The body grows better with waters that are flowing and purified by the sun but they do not grow properly, age quickly and suffer from an array of diseases when they consume marsh water that changes temperature quickly and that is full of sediment. See Table 2.1 for an overview of the effects healthy and unhealthy waters have on the human body and the natural environment:

Table 2.1: A comparison between healthy and unhealthy waters and their effects on the human body and natural environment in popular beliefs and medicine.

	Natural environment	Human body
Healthy waters	• Light, sweet and clear waters • Nymphs and fertility deities • Growth, fertility and good harvests • Cold in summer, hot in winter	• Fertile women and easy births • Inhabitants grow well with blooming complexions • Little disease (balanced)
Unhealthy waters	• Stagnation/build up of sediment in waters • Gateway to the underworld • Stunted growth • Hot in summer, cold in winter	• Dryness • Premature aging barrenness and death • Inhabitants do not grow well and are flabby and ill-complexioned • A variety of diseases all year round (excess)

Conclusions

The effects produced in the natural world by waters and earth are reduplicated in the human body. The temperature and nature of the earth and waters have similar effects on both the interior and exterior of the body. The earth has a particular cooling and

drying effect on the body because it is a cold and dry substance. On the exterior surface of the body it cools when applied with water and dries the skin. Within the body, earth in the form of sediment creates a hardness and a drying effect such as the stiffening effect of sea water on the digestive organs and the creation of stone caused by mixed waters that contain a lot of sediment. These effects can be compared to silting in the natural environment where rivers begin to dry up because of the build up of sediment in the river bed.

Waters have varying effects on the body depending on where they come from in the water's course and depending on how their qualities are applied to the human body. Waters deemed healthy in the natural world are found at the beginning of a river's course and are light, sweet and purified by the sun. They promote growth and fertility in the natural world and in the human body, which is articulated through both myth and medicine. Unhealthy waters are heavy in sediment, turbid and stagnant found at the end of a river's course in marshes. They promote aging, death and disease and have strong associations with death and the underworld.

Hot waters can both moisten and dry the body. By warming it and drawing out water it leaves sediment in the veins and dries out the skin. This process is identical to the effect of the sun on waters when the heat draws up the finest and lightest part. Heat can also be conductive to moisture in the human body owing to its ability to draw moisture to itself in both the natural environment and the body. Warm water moistens sores and the consumption of waters that are hot in the summer can produce an excess of moisture in the body causing phlegmatic fluxes.

Cold waters, on the other hand, can dry and harden the skin and the digestive organs. Frozen waters contain an abundance of earthy material making them dry and

their dry nature extends to the body when consumed causing diseases associated with the dry. The cold can also be conductive to moisture where it dries up sweating causing the body to retain its moisture.

The temperature of the water and whether that brings on moist or dry effects is very similar to the effects that the winds produce on both the land and the body. The winds have a close association with waters and the effects produced on waters are identical to the effects on the human body owing to a close association between heat, moisture, and air in both the human body and the natural environment.

Airs and Winds

Introduction

This section will explore the different natures of airs and winds and their parallel effects on the natural world and the human body. In the previous section, we saw how cold and warm waters affected the body. The effects of the winds are often similar to the effects of waters where the cold winds dry and contact like cold waters and the warm winds can either warm and dry or warm and moisten. In the first part of this section, the relationship between air, heat, and moisture in the micro-/macrocosm will be explored. The texts used will be from the Hippocratic Corpus in the main with some examples from Aristotle and the Presocratic philosophers in order to further demonstrate patterns of thought about the way air, heat and moisture function in both the natural world and the human body and how the boundary between natural environment and human body is crossed by these powers. The second part of this section will concentrate on the Hippocratic texts and their views about the nature of winds and their effects. It will focus on *On the Sacred Disease,* which is the only Hippocratic text offering a comprehensive description of the winds and their effects, and use it as a comparison to other Hippocratic texts.

The function of air in both the natural environment and the human body is a complex matter. In Homer, air in the natural environment can have two forms; when it is associated with mist it is called ἀήρ but when it is clear and bright it is αἰθήρ.[365] In the human body, the soul or ψυχή and θυμός were airy substances found inside the body[366] but later on in the fifth and fourth centuries terms such as ἄνεμος, πνεῦμα, and φῦσα were all terms that referred to air both inside and outside the body often referring to winds and to air that was essential for life.[367]

Some treatises explored in this section draw a distinction between air or breath in the body and air or the wind outside it whereas others do not. The air could enter the body through the skin and the nose and mouth where it then entered the vessels and affected the whole body. Air, heat, and moisture were all deemed vital for life and life processes and the relationship between all three both inside and outside the body is important for understanding how different airs and winds affected the body.

1. Air, heat, and moisture in the micro-/macrocosm

This part will explore the micro-/macrocosmic relationship between breath, bodily fluids and internal heat within the body and the parallel relationship between winds, waters, and heat in the natural environment. This relationship is important not only for understanding how air affected the body but is also important for understanding how air entered the body and its function once inside. Frixione has explored the intimate links between heat and air in his recent work and van der Eijk has discussed

[365] Erotian notes in his *Hippocratic Lexicon* that in Homer ἀήρ is used for mist and a lower section of air that does not extend past the height of a temple: Erotian, *Hippocratic Lexicon,* 45, l.3-5. For αἰθήρ in Homer see *Iliad*, 8.556-560; Lloyd (2007) 137.
[366] For a discussion of these terms and their meaning in Homer see Padel (1992) 27-32.
[367] See pp.119-128.

the link between the body, the blood and the πνεῦμα in fifth and fourth century thought.[368] However, the relationship between air, heat, and moisture and how they affect each other in both the natural environment and the human body has not been explored to any length.[369]

It will be useful first to discuss some of the main terms used for air, wind, and breaths since the terms used can be different when air is inside the body to those used for air outside the body and some terms have connotations associated with heat and moisture. The words ἀήρ (or ἠήρ), ἄνεμος, πνεῦμα, and φῦσα are usually used to denote air both inside and outside the body in our period.[370] The term ἀήρ is generally used for the air outside the body in the natural world and is usually the term used for the element air in natural philosophy.[371] The term ἄνεμος is the word for wind outside the body but can also be used to denote winds within the body.[372] Again, πνεῦμα can mean breath within the body and breath outside the body. Later, this word is identified with the soul of a human and the world soul in Stoic doctrine.[373]

The term φῦσα in the Hippocratic Corpus can mean breath within the body but again can be used for the outside world. For example, it is the word used for bellows.[374] Indeed, φῦσα is the word that the author of *On Breaths* uses as the title

[368] Frixione (2013) 505-28; van der Eijk (2005) 119-135.
[369] Lonie touches on it in his commentary on the Hippocratic text *On the Nature of the Child:* Lonie (1981) 148-9.
[370] Erotian notes that ἀήρ is used for mist or a lower stratum of air in the natural world and for breaths within the human body: Erotian, *Hippocratic Lexicon,* 45, l.2-6. LSJ s.v. ἄνεμος, πνεῦμα, and φῦσα. For ἀήρ see the discussion of the words used in *On Breaths* in the main body of the text on this page. The term πνεῦμα is the most common term used in the Hippocratic Corpus see Index Hippocraticus s.v. πνεῦμα.
[371] Aristotle, *Meteorology,* I, 2 339a16; Lloyd (2007) 137. Lloyd also notes that Empedocles does not use this term, instead he generally uses the word αἰθήρ.
[372] Lloyd (2007) 136; Hippocrates, *On Diseases of Women* II, 8.358.19; *On the Nature of Women,* 64 Potter=7.400.11. Here the uterus becomes inflated with wind: ἀνεμόομαι**.**
[373] Lloyd (2007) 137 -8.
[374] Lloyd (2007)137; Thivel (2005) 240. Index Hippocraticus s.v. φῦσα.

for his treatise. This author makes the distinction between ἀήρ and φῦσα stating that ἀήρ is what exists in the natural world outside the body, but when it enters the body, it is φῦσα and both are types of πνεῦμα.[375] He goes on to describe the wind (ἄνεμος) as '...a flowing and a current of air' (Hippocrates, *On Breaths*, 3, 5.106.4 Jouanna = L6.94.4).[376] However, this author sometimes uses these terms interchangeably using ἀήρ when, going by his distinction, he should use φῦσα.[377]

In other treatises such as *On Regimen* I and II, the author does not make this distinction between air within the body and air outside it but πνεῦμα refers both to air inside the body and the wind outside.[378] The same is true in *On the Sacred Disease* where the author uses πνεῦμα to describe winds outside the body[379] and breath that is taken into the body.[380] Moreover, in the same treatise the word ἀήρ is also used to describe air outside the body and within the body.[381] Thus, there is no agreement and often no clear distinction between terms used to denote air within the body and air outside it.

Some of the terms discussed above not only have connotations of wind or breath but also denote forms of precipitation or moisture. For example, in Homer, ἀήρ can refer to clouds or mist.[382] In Hippocratic texts, there is sometimes a suggestion that πνεῦμα is moist in some way and needs moisture in order to nourish

[375] Hippocrates, *On Breaths*, 3, l.4-5 Jones =L6.94.1-2.; Lloyd (2007) 138.
[376] Craik dates this treatise to the final decades of the fifth century making it roughly contemporary with *On the Sacred Disease* and other important Hippocratic works for the nature and effects of air: (2015) 102. *On Breaths* has parallels with Presocratic works see Craik (2015) 101-2 and Jouanna (1988) 106 n.3.
[377] Hippocrates, *On Breaths*, 7, l.16 Jones=L6.100.4; Lloyd (2007) 138.
[378] Hippocrates, *On Regimen* I, 10 l.9, 13 Jones=L6.484.22 and 6.488.14-20, and *On Regimen* II, 38 l.1-2 Jones=L6.530.11-12; *On the Sacred Disease*, 16 l.1 Jones =L.6.384.4.
[379] Hippocrates, *On the Sacred Disease*, 19 Jones =L6.390.9-392.4.
[380] Hippocrates, *On the Sacred Disease*, 7 and 16 Jones =L.6.368.1-9 and 384.4-386.14.
[381] Air outside the body: *On the Sacred Disease*, 7, l.3 Jones=L6.368.2 and air inside the body: 10, l.21-2 Jones=L6.19-20.
[382] Homer, *Iliad*,5 776, 8.50, 14.288; Thivel (2005) 240.

itself.[383] In Aristotle, the term ἀτμίς is used to denote the moist exhalations and literally means a moist vapour or steam, which causes the winds among other phenomena.[384] Correspondingly, words associated with air can also have associations with fire. For example, the term αἰθήρ was employed to refer to elemental air by Empedocles, and Plato used αἰθήρ to refer to the brighter, clearer air, which he distinguished from the misty ἀήρ.[385] This term usually refers to the heavenly sphere, which was thought to be fiery or hot by early philosophers and physicians.[386] Indeed, Anaxagoras supposedly used the term αἰθήρ to denote fire rather than air according to Aristotle.[387] These different meanings of words used for air are significant since they show us what other factors might be associated with a certain term. Indeed, from these examples there is the suggestion that there were links between fire or heat, breath or air, and moisture.

For ancient philosophers, a body of air lay between the earth and its waters and the often fiery heavenly sphere. This atmospheric zone was the place where waters became air and air became fiery or turned back into water. For example, Anaximenes posited the theory that everything came from air and that, as it became thicker, it became clouds and water and eventually earth, but as it became more rarefied, it became fiery.[388] In the theories of Anaximander, the fiery heavenly bodies were enclosed in a sort of air-mist suggesting that a type of moist air surrounded the hot and fiery parts of the heavenly sphere.[389] Plato believes that air is

[383] Hippocrates, *On Regimen* II 38, l.3-8 in particular for the idea that winds arise from moisture and Hippocrates, *On Regimen* II, 37, l.22-6 for the idea that the wind attracts moisture to itself when it is dry to nourish itself. See below p.131 on the nature of the south wind for the idea that winds carry rains or are conductive to moisture in the Hippocratic Corpus.
[384] Aristotle, *Meteorology* II, 4 361a22-25.
[385] Empedocles: DK31 B98=KRS 373 and DK31 B115=KRS 401; Plato, *Timaeus*, 58d.
[386] Hippocrates, *On Fleshes*, 2, l.5-6 Potter=L8.58412-13. Aristotle, *Meteorology* I, 3 340b29-31.
[387] Aristotle, *On the Heavens* I, 3 270b24-5 cf. Anaxagoras: DK59 B15=KRS 489; Lloyd (2007) 137.
[388] Anaximenes: KRS 141 = Hippolytus, *Refutation of the Herasies*, I, 7, 1.
[389] Lloyd (1964) 97; Anaximander: KRS 125 = Hippolytus, *Refutation of the Herasies*, I, 6, 4-5.

generated from water and when ignited becomes fire but when condensed becomes cloud and mist and then becomes water again.[390] Aristotle maintains that air is what lies between the earth and its waters and the heavens but it has two layers. The layer next to the earth is moist and cold since it is closest to the water and the layer closest to the heavens is dry and hot because it is closest to the divine αἰθήρ, the rotation of which causes the inflammation of air.[391] In the Hippocratic treatise *On Fleshes,* once the divine heat had separated and ascended to the heavenly sphere, air lay between it and the earth.[392] Thus, air was very much an intermediary substance between the fiery heavenly sphere and the terrestrial sphere. Owing to this, the air has links with the hot heavenly sphere and the moisture on earth and serves as a medium through which change occurs.

In Aristotle's theories air is generated from water[393] and wind blows from 'marshy districts of the earth.'[394] He gives a more full explanation of what causes the winds in this passage:

> We recognise two kinds of exhalation (ἀναθυμίασις), one moist, the other dry. The former is called vapour (ἀτμίς): for the other there is no general name but we must call it a sort of smoke (καπνός)...Now when the sun in its circular course approaches, it draws up by its heat the moist evaporation (τὸ ὑγρόν)...but there is a great quantity of fire (πῦρ) and heat (θερμότης) in the earth, and the sun not only draws up the moisture (ὑγρὸν) that lies on the surface of it, but warms and dries the earth itself. Consequently, since there are two kinds of exhalation...That in which moisture predominates is the

[390] Plato, *Timaeus,* 49c.
[391] Aristotle, *Meteorology,* I, 3.340a19-241a36; it should be noted that the αἰθήρ itself is not fiery: see above p.60 n.181.
[392] Hippocrates, *On Fleshes,* 2, l.3-10 Potter =L.8.584.10-12.
[393] Aristotle, *Meteorology,* I, 3.340a25.
[394] Aristotle, *Meteorology,* I, 3.340b36-7.

source of rain...while the dry one is the source and substance of all winds.[395] (Aristotle, *Meteorology,* II, 4 359b29-360a14)

Though wind is a type of smoky exhalation for Aristotle that is hot and dry, the exhalation still arises from the moisture that is contained in the earth. For example, in numerous places within the *Meteorology,* Aristotle mentions how this smoky exhalation rises from the earth when the sun heats moist earth after rains have fallen.[396] This exhalation is dryer in nature because it has come from the earth and not from a body of water such as a lake or a river. The air also has a close connection to the fiery part of the heavenly sphere for Aristotle because the air closest to the movement of the αἰθήρ has the potential to become fire.[397]

In the Hippocratic treatise *On Regimen* II, the author also believes that the winds arise from moisture:

> All winds have a power of moistening and cooling both animal and vegetable bodies for this reason; because all these winds must come either from snow or ice or places severely frozen, or from rivers or lakes, or from moist and cold land.[398] (Hippocrates, *On Regimen* II, 38, 160.2-5 Joly-Byl =L6.530.12-16) [399]

[395] ἔστι γὰρ δύ’ εἴδη τῆς ἀναθυμιάσεως, ὥς φαμεν, ἡ μὲν ὑγρὰ ἡ δὲ ξηρά· καλεῖται δ’ ἡ μὲν ἀτμίς, ἡ δὲ τὸ μὲν ὅλον ἀνώνυμος, τῷ δ’ ἐπὶ μέρους ἀνάγκη χρωμένους καθόλου προσαγορεύειν αὐτὴν οἷον καπνόν…φερομένου δὴ τοῦ ἡλίου κύκλῳ, καὶ ὅταν μὲν πλησιάζῃ, τῇ θερμότητι ἀνάγοντος τὸ ὑγρόν…ὑπάρχει δ’ ἐν τῇ γῇ πολὺ πῦρ καὶ πολλὴ θερμότης, καὶ ὁ ἥλιος οὐ μόνον τὸ ἐπιπολάζον τῆς γῆς ὑγρὸν ἕλκει, ἀλλὰ καὶ τὴν γῆν αὐτὴν ξηραίνει θερμαίνων· τῆς δ’ ἀναθυμιάσεως….τούτων δ’ἡ μὲν ὑγροῦ πλέον ἔχουσα πλῆθος ἀναθυμίασις ἀρχὴ τοῦ ὑομένου ὕδατός ἐστιν… ἡ δὲ ξηρὰ τῶν πνευμάτων ἀρχὴ καὶ φύσις πάντων.

[396] Aristotle, *Meteorology,* II, 4 360a25; 4 360b31;5 361b34-362a6.

[397] Aristotle, *Meteorology,* I, 3 340b26-9 and 341a1-3.

[398] Φύσιν μὲν ἔχει τὰ πνεύματα πάντα ὑγραίνειν καὶ ψύχειν τά τε σώματα τῶν ζώων καὶ τὰ φυόμενα ἐκ τῆς γῆς διὰ τάδε· ἀνάγκη ἐστὶ τὰ πνεύματα ταῦτα πάντα πνέειν ἀπὸ χιόνος καὶ κρυστάλλου καὶ πάγων ἰσχυρῶν καὶ ποταμῶν καὶ λιμνέων καὶ γῆς ὑγρανθείσης καὶ ψυχρανθείσης.

[399] This can also be seen in *On the Sacred Disease* 16 Jones=L6.384.4-386.14.

It is significant that winds were thought to originate from the moist parts of the earth by the Hippocratic physicians since many held the view that the different strength of waters in particular were affected by the winds.[400] The author of *On Regimen* II describes how winds can lose their moisture over mountainous regions and they then become dry, rare and hot and attract moisture again.[401] This makes the wind parching since the heat of it draws moisture from everything.

The same types of processes involving breath, heat and moisture in the natural world, are also found in the human body. The best example of this can be seen in the process of breathing. As heat attracts air or breath in the natural world so the internal heat attracts breath into the body or controls it.[402] Frixione is right, however, when he argues that heat does not have a complete dominance over breath in the heat-breath relationship since breath can constrain fire by taking the moisture for itself as nourishment or it cools the inner heat which we see in *On Regimen* I and also in *On the Sacred Disease*.[403] In *On Regimen* I, breath (πνεῦμα) is drawn to the heat from the fire in the embryo suggesting that this is how the body takes it in.[404] In the *Timaeus*, though breathing largely takes place through a horror vacui effect, the air is also drawn into the body by the natural heat through the nostrils and the skin.[405] In Aristotle, the heart is the centre of the natural heat and it behaves like bellows. As the heat increases the heart expands and the expansion causes air to rush in. The

[400] Hippocrates, *Airs, Waters, Places*, 9, l.14-16 Jones =L2.38.5-6.
[401] Hippocrates, *On Regimen* II, 37, l.22-31 Jones =L6.528.15-530.1
[402] For an example of the inner heat controlling the breath see Hippocrates, *On Fleshes*, 6 Potter =L8.592.1-594.5.
[403] Frixione (2012) 517-8; Hippocrates, *On Regimen* I, 13 Jones =L6.488.14-20; *On the Sacred Disease*, 10, l.19-20 Jones =L.6.372.18-19.
[404] Hippocrates, *On Regimen* I, 9, l.4-6 Jones=L6.482.15-17.
[405] Plato, *Timaeus*,79b1-e9.

cooling effect of the air causes the heart to decrease again and the air is expelled now it is warmed.[406]

A similar relationship between heat and breath can be seen in *On the Nature of the Child* where the author, while describing how an embryo is formed states, '...everything that is warmed sends out breath, and draws back fresh, cold air in return, from which it is nourished.' (Hippocrates, *On the Nature of the Child*, 1 Potter= L7.488.7-8) Here, cold air is taken in which nourishes the embryo and when it is warm it is expelled. In addition, the author states that everything that is warm draws cold air to itself implying that this happens in the natural world too.

In this treatise, breath is nourishing and a similar idea can be seen in *On Regimen* I where moisture is considered nourishing in the human body.[407] The breath is attracted into the body by the heat of the internal fire and when the breath enters the body it constrains the fire by taking away the nourishing water.[408] The same process occurs in the natural world according to *On Regimen* II where the winds bring moisture to everything and cool everything because they blow from waters, ice, and snow but the winds can also take moisture away from bodies when it is hot and dry in order to nourish itself.[409]

Once inside the body, the breath often shares the vessels with the blood.[410] This idea can be seen in *On the Nature of Bones* where the vessels contain both

[406] Aristotle, *Parts of Animals*, III, 4 666a2-4.; Aristotle, *On Youth, Old Age, Life and Death, and Respiration*, 27(21) 480a23-480b5; Furley and Wilkie (1984) 17-18.
[407] Hippocrates, *On Regimen* I, 3, l.9-10 Jones =L6.472.20-21.
[408] Hippocrates, *On Regimen* I, 13 Jones =L6.488.14-20.
[409] Hippocrates, *On Regimen* II, 37, l.23-6 Jones =L6.528.16-19 and 38, l.37-8 Jones =L6.532.10-11 and 38, l.3-8 Jones = L6.53012-16. These treatises are roughly contemporary, both dated to the late fifth century: Craik (2015)118 and 275.
[410] Hippocrates, *On the Sacred Disease*, 10, l.51-4 Jones =L6.374.18-20; *On Breaths*, 10, l.5-10 Jones=L6.104.19-22.

blood and breath.[411] The contemporary philosophers Empedocles and Diogenes of Apollonia also put forward ideas about breathing that involved the blood and the blood vessels.[412] In the theories of Empedocles, as air is taken into the body the blood retreats from the vessels pushed back by the air, as the air goes out the blood then runs back into the veins. Empedocles uses an image of a clepsydra to demonstrate this process where water acts like the blood in the body.[413] Diogenes believed that air contained thought in the body and that if all air-like substance retreated from the veins then death ensued suggesting that air shared the veins with the blood.[414]

A similar phenomenon can be seen in the natural world where breath is found in water. For example, in *On the Nature of the Child,* the author explains how breath (πνεῦμα) moves in and out of water:

> Now in summer the earth is rarefied and light and contains water in it, and the water flows downwards. As this water flows, it constantly exhales one breath of vapour after another, and these exhalations pass through the light, rarefied earth and produce coldness in it, and also cool the water itself...[415] (Hippocrates, *On the Nature of the Child*, 14 Potter =L7.522.15-20)[416]

[411] Hippocrates, *On the Nature of Bones*, 11 Potter=L9.182.3-4. This treatise is dated to the late fifth century: Craik (2015) 229.
[412] Both flourished in the mid-late fifth century. See Kirk, Raven, and Schofield (1983) 434 for Diogenes and p.81 n.248 for Empedocles.
[413] Empedocles: DK31 B100; For a discussion on this passage see Furley and Wilkie (1984) 3-5; Lambridis (1976) 94; Kirk, Raven and Schofield (2007) 359-60 n1.
[414] Diogenes:DK64 B5 and DK64 A29; Harris (1973) 26; Furley and Wilkie (1984) 10.
[415] Καὶ τότε δὴ ἡ γῆ ἀραιή ἐστι τοῦ θέρεος καὶ κούφη καὶ ὕδωρ ἐν αὐτῇ ἔχουσα· καὶ τὸ ὕδωρ ῥέει ἐς τὰ κατάντεα· χωρέοντος δὲ τοῦ ὕδατος αἰεὶ ἀποπνέει αὐτόθεν ἕτερον ἐξ ἑτέρου πνεῦμα· τὸ δὲ ἀποπνέον διὰ τῆς γῆς ἔρχεται κούφης καὶ ἀραιῆς ἐούσης καὶ ψῦχος τῇ γῇ ποιέει, καὶ αὐτὸ τὸ ὕδωρ συμψύχεται.
[416] Lonie in his commentary on this treatise notes that this author equates breath with the life force. It is therefore possible that waters contain this life force in ancient thought as living beings do. Lonie (1981)148. Lonie also notes that moisture produces breath when heated in this treatise therefore showing another link between moisture, heat and, breath. Lonie (1981) 148.

In *On Breaths*, air is found in the sea because fish would not be able to live if air did not exist in water.[417] The air co-habits with the blood in the human body just as air co-habits with water in the natural world.

There is a close relationship between moisture, breath, and heat in these treatises. [418] Heat draws both breath and moisture to itself in both the human body and the natural world. Owing to the fact that the relationship between heat, breath, and moisture is comparable in both the natural world and the human body, the effects that the different winds have on the human body are comparable to the effects it has in the natural environment. The natures of the winds whether they were hot or cold, wet or dry had a powerful impact on the human body and on the natural environment because the interaction between heat, moisture, and air is the same in both the natural world and in the human body. All of the winds had different natures in the ancient world, but the north and south wind were considered the strongest winds with the most opposing effects.

2. The nature of airs and winds

The differing natures of the winds had different effects on both the land and the human body and they were considered powerful forces. The winds were recognised as deities and sacrificed to in order to call them forth or send them away. They were sacrificed to in times of need and regular rites were only performed in order to call forth annual winds, such as the cooling Etesian winds, or to ask for calm winds at the

[417] Hippocrates, *On Breaths*, 3, l.25-31 Jones =L6.94.17-22.
[418] For the relationship between air and heat see Frixione (2012) 519-22; For the relationship between air and moisture see Thivel (2005) 244.

time of year when the weather was particularly threatening.[419] Though in many instances cult was paid to the winds on an ad hoc basis, this is not to say that the winds were not considered powerful deities.[420]

The descriptions of the winds tend to be schematic in nature and the effects they have follow this schema closely. The two winds that show this to the greatest degree are the north and south winds. The north and south winds are the two most powerful winds in ancient medical thought and are the most discussed regarding the effects on the body in the ancient texts. Their effects on the human body and the rest of the natural world are mentioned more than easterly or westerly winds, which are usually classed as either northerly or southerly winds.[421]

However, there is some level of disagreement as to the nature of these winds. The main texts used are *On the Sacred Disease, Aphorisms, Humours, Airs, Waters, Places, On Regimen* II and Aristotelian texts *Meteorology* and *Problems* because they all offer views on the nature and effects of winds. All agree that when the winds reach the Mediterranean the north wind is cold and the south wind warm. The treatise *On Regimen* II, though it is roughly contemporary with the treatises examined here, offers a different view of the winds stating that the north wind is a moist wind bringing much precipitation whereas the others believe it is a wind that clears the air of moisture.[422] The same applies to the south wind where *On Regimen* II believes that it can be a particularly parching wind but others believe that it brings much moisture.

[419] Parker (2011) 74; Burkert (1985) 175 Paus. 2.34.2-3.
[420] Larson (2010) 69.
[421] Hippocrates, *On the Sacred Disease,* 16 Jones =L6.384.4-386.14; Aristotle, *Meteorology*, II, 4 361a5-9.
[422] All date from the mid-late fifth century: Craik (2015) 11, 34, 134, 195.

The south wind is widely considered a warm wind highly conductive to moisture bringing rains and mist. For example, Homer describes how mist is wrapped around the mountain tops by the south wind.[423] In addition, Herodotus attempts to offer an explanation as to why the winds blowing from the southerly regions of the world, such as Libya, are more rainy than other winds. He states that the water attracted into the upper regions by the sun is caught up by the winds there and this moisture is scattered.[424] When the south winds reach Greece, they are rainy in nature for this reason.

In the *Odyssey*, the north wind rolls a great wave before him when all the winds clash.[425] This idea that the north wind brings a tempestuous sea can be seen in Herodotus when he tells of how the Athenians prayed to Boreas to ask him to blow over the sea and wreck the Persian fleet and he answered their plea.[426] It is not clear whether this wind brings precipitation with it in this context or whether it blows the precipitation before it. It seems that Boreas blows waters before him when he rolls the waves before him rather than bringing tempestuous weather with him.

These images of the north wind as a force that blows stormy weather before it and the south wind as one which brings moist weather with it are maintained in ancient philosophy and medicine. When describing the nature of the north wind, Aristotle holds that it is a cold wind as it blows from regions that are full of moisture:

> The north wind, on the other hand, coming from moist regions, is full of vapour and therefore cold. It brings fine weather in our part of the world

[423] Homer, *Iliad*, 3.10-12.
[424] Hdt. 2.25.
[425] Homer, *Odyssey*, 5.296.
[426] Hdt. 7.189.

because it drives the clouds away before it, but in the south it is rainy...[427]

(Aristotle, *Meteorology,* II, 3 358a34-358b2)

Here, it should be noted that, though this wind brings clouds, it drives them away from the region of Attica and thus brings fine weather and a clear atmosphere making it a drier wind than the south. In the Hippocratic Corpus, the treatises *On the Sacred Disease* and *Airs, Waters, Places* both state that the north wind has a clearing effect in the natural environment where it separates and clarifies.[428]

The south wind was thought to be highly conductive to moisture in the Hippocratic texts maintaining the view found in Homer and Herodotus that the south wind could bring rain, mist, and fog. The author of *Airs, Waters, Places* states that inhabitants of a city exposed to the south wind tend to be phlegmatic in constitution suggesting that these winds must have a moistening effect. Later on in the treatise, the author describes a certain type of year that is hot and wet and he states that the earth is not only soaked by the spring rains but by the south wind, which also adds to the heat of the year.[429] In this treatise, the south wind is hot and moist in nature.

One of the most important treatises for the effects of the north and south wind on the human body is *On the Sacred Disease*. This author holds that the south wind is warm and highly conductive to moisture while the north wind is a cold wind that separates and makes everything clearer.[430] This is also true in other

[427] ὁ δὲ βορέας ἅτε ἀφ' ὑγρῶν τόπων ἀτμιδώδης· διὸ ψυχρός· τῷ δ' ἀπωθεῖν αἴθριος ἐνταῦθα, ἐν δὲ τοῖς ἐναντίοις ὑδατώδης. ὁμοίως δὲ καὶ ὁ νότος…
[428] Hippocrates, *On the Sacred Disease,* 16 Jones = L6.384.4-386.14; *Airs, Waters, Places,* 6, l.18-19 Jones =L2.26.2-3.
[429] Hippocrates, *Airs, Waters, Places,* 10, l.14-17 Jones =L2.43.15-44.1.
[430] Hippocrates, *On the Sacred Disease,* 16, l.7-9 Jones=L6.384.8-10 and l.14-27 Jones=L6.384.13-22.

contemporary treatises such as *Aphorisms* and *Humours*, which will be compared to *On the Sacred Disease* below.[431]

In the Hippocratic Corpus and the works of Aristotle, the nature of the winds are sometimes determined by the regions from which they are blowing. For example, in *On Regimen* II, though this author maintains that all winds begin cold and moist in nature because they arise from moisture, he goes on to say that the winds blow through certain regions and these regions determine the characteristics of the wind: [432]

> Now all winds have a cooling and moistening nature. But winds differ from one another according to the situation of the countries and places through which they come to the various regions, being colder, hotter, moister, drier, sicklier or healthier.[433] (Hippocrates, *On Regimen* II, 38, 160.8-11 Joly-Byl=L6.530.20-23)

For this author, the south wind is sometimes hot and dry because of the regions it passes through:

> The south blows sometimes from places that are of the same nature as the north; for when it blows from the south pole and starts from much snow, ice and severe frosts, it must of necessity blow to those who dwell there near it after the same manner as the north does to us. But it does not come the same to every country; for instance, when it blows through the approaches of the sun under the south, the moisture is absorbed by the sun. As it dries it

[431] All date to the mid to late 5th C? See Craik,34, 134, 195.
[432] Hippocrates, *On Regimen* II, 38, l.3-8 Jones =L6.530.12-16.
[433] Φύσιν μὲν οὖν ἔχει ψύχειν καὶ ὑγραίνειν τὰ πνεύματα πάντα. Διὰ θέσιν δὲ χωρίων καὶ τόπων, δι' ὧν παραγίνεται τὰ πνεύματα ἐς τὰς χώρας ἑκάστας, διάφορα γίνεται ἀλλήλων, ψυχρότερα, θερμότερα, ὑγρότερα, ξηρότερα, νοσερώτερα, ὑγιεινότερα.

becomes rare, and therefore of necessity it must reach here hot and dry.[434]

(Hippocrates, *On Regimen* II, 38, 160.16-22 Joly-Byl=L6.532.4-11)[435]

However, it must be noted that the author of *Regimen* II believed that the south winds can also be moist in nature if they have blown over the ocean rather than the land maintaining the mythological picture of the south wind we saw earlier.[436]

Aristotle also states that the south winds can be warm and dry due to the hot and dry regions they pass through:

> The south is the warmest of the winds, both in size and strength, and it blows from dry and hot regions. Hence it carries little moist vapour and that is why it is hot. (It makes no difference even if this is not its true character and it is originally a cold wind, for it becomes warm on its way by incorporating with itself a great quantity of dry exhalation from the places it passes over.)[437]
>
> (Aristotle, *Meteorology*, II, 3 358a30-34)

However, though Aristotle believed the south wind to contain little moisture, he states that this wind allows an accumulation of moisture to take place whereas the north wind does not making it drier than the south wind despite the fact that the north wind naturally blows from a place where there is more moisture:

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[434] Ὁ δὲ νότος πνέει μὲν ἀπὸ τῶν ὁμοίων τὴν φύσιν τῷ βορέᾳ· ἀπὸ γὰρ τοῦ νοτίου πόλου πνέων, ἀπὸ χιόνος πουλλῆς καὶ κρυστάλλου καὶ πάγων ἰσχυρῶν ὁρμώμενος, τοῖσι μὲν ἐκεῖσε πλησίον αὐτοῦ οἰκοῦσιν ἀνάγκη τοῖον πνέειν ὁκοῖόν περ ἡμῖν ὁ βορέας. Ἐπὶ δὲ πᾶσαν χώρην οὐκ ἔτι ὅμοιος παραγίνεται· διὰ γὰρ τῶν ἐφόδων τοῦ ἡλίου καὶ ὑπὸ τὴν μεσημβρίην πνέων, ἐκπίνεται τὸ ὑγρὸν ὑπὸ τοῦ ἡλίου· ἀποξηραινόμενος δὲ ἀραιοῦται· διὸ ἀνάγκη θερμὸν αὐτὸν καὶ ξηρὸν ἐνθάδε παραγίνεσθαι.

[435] For similarities to the theories of Anaxagoras about the winds see Joly-Byl (1984) 263-4 n.160,17.

[436] Hippocrates, *On Regimen* II, 38, l.45-7 Jones=L6.532.16-18.See pp.130.

[437] ὅ τε γὰρ νότος καὶ τῷ μεγέθει καὶ τῷ πνεύματι ἀλεεινότατος ἄνεμός ἐστιν, καὶ πνεῖ ἀπὸ τόπων ξηρῶν καὶ θερμῶν, ὥστε μετ’ ὀλίγης ἀτμίδος. διὸ καὶ θερμός ἐστιν· εἰ γὰρ καὶ μὴ τοιοῦτος, ἀλλ’ ὅθεν ἄρχεται πνεῖν ψυχρός, οὐδὲν ἧττον προϊὼν διὰ τὸ συμπεριλαμβάνειν πολλὴν ἀναθυμίασιν ξηρὰν ἐκ τῶν σύνεγγυς τόπων θερμός ἐστιν·

> For the south wind attracts cloud, whereas the north wind dispels it, and more evaporation appears to take place when the wind is in the north than when it is in the south, and in winter than in summer...[438] (Aristotle, *Problems,* XXV, 18 939b19-21)[439]

> But the north winds quench the heat before any considerable quantity of vapour has gathered, while in a south wind the evaporation is allowed to accumulate.[440] (Aristotle, *Meteorology,* I, 10 347b9-10)

Here, it is the heat of the south wind that allows this accumulation of moisture to take place. Indeed, Aristotle goes on to say that a rainbow often appears with southerly winds due to the moisture in the air, which causes a reflective surface for the light:

> A rainbow appears round these in winter, generally with southerly winds...It is down to the moistness of the air...for a mirror is then formed.[441] (Aristotle, *Meteorology,* III, 4 374a20-5)

This further proves that the southerly winds are more conductive to moisture than any others according to Aristotle's theories. The south wind is not moist by the time it is blowing in the Mediterranean, but, due to its heat, it promotes the accumulation of moisture whereas the north wind, though it is inherently moist as we saw above, quenches heat and therefore does not allow evaporation to accumulate.

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[438] ὁ μὲν γὰρ νότος ἄγει τὸ τοιοῦτον, ὁ δὲ ἀπωθεῖ. καὶ ἀτμίζειν δὲ φαίνεται βορείοις μᾶλλον ἢ νοτίοις, καὶ χειμῶνος ἢ θέρους.

[439] For the date of *Problems* and how it can be compared to Hippocratic and Aristotelian treatises see p.4 n.5.

[440] ἀλλὰ τὰ μὲν βόρεια σβέννυσιν πρὶν συστῆναί τι πλῆθος, ἐν δὲ τοῖς νοτίοις ἐᾶται ἀθροίζεσθαι ἡ ἀναθυμίασις.

[441] περὶ γὰρ τούτους τὰ πλεῖστα νοτίων ὄντων ἶρις γίγνεται τοῦ χειμῶνος… γίγνεται δ' ἀπό τε τῆς τοῦ ἀέρος ὑγρότητος…τότε γὰρ γίγνεται ἔνοπτρον.

Thus, the north and south wind are considered to be opposing forces in the ancient texts treated in this thesis. The south wind is warm and is generally quite conductive to moisture depending on the type of region it blows from. The north wind is cold and generally clearing in nature since it blows precipitation before it suggesting that it drives rain clouds away. See Table 2.2 for a comparison between the different effects of the north and south wind in medical theory and popular beliefs.

The winds are one of the most powerful factors in determining a change in the air and the weather in the works of Aristotle and in the Hippocratic Corpus. Like the winds in ancient religion and cult, the winds have particular characteristics and different natures meaning they bring on fine or rainy weather. The ancient physicians and philosophers extended the qualities of the winds to the human body when describing the different ailments and diseases the different winds could bring on.

Table 2.2: A comparison between the effects of the north and south wind in popular beliefs from Homer to Herodotus and medicine/philosophy.

	Myth/popular beliefs	Medicine/philosophy
North wind	• Boreas rolls precipitation before him	• Clears the air of precipitation
South wind	• Notos creates mist and brings precipitation	• Very conductive to moisture (except *On Regimen* II where it is sometimes dry)

3. The effects of the winds

The treatise *On the Sacred Disease* is one of the most important for the natures of the winds and their effects on both the human body and the natural world in our period. Throughout the discussion of the effects of the winds in this text, the effects of the winds on the human body are compared to the effects the wind has on the natural world. Here, the human body is operating in the same way as the natural environment since it parallels the processes occurring in the natural world when certain winds blow.

The main focus of the treatise is the effects the winds have on those who suffer from the sacred disease but the physician offers explanations for the general effects of the winds therefore not strictly confining himself to the effects on those who suffer from this disease. This makes this treatise comparable to other treatises that state the effects of winds on the human body and the natural world and is useful when attempting to explain why other treatises attribute certain ailments or diseases to a particular wind. This part hopes to shed light on theories held about the natures and effects of winds held in the treatises *Aphorisms, Humours, Airs, Waters, Places* and parts of the *Epidemics* that offer mere sentences about the effects of the winds without any explanation. By comparing them to *On the Sacred Disease*, the effects of the north and south winds put forward by these treatises will be further elucidated showing that the same schema for north and south winds are found in terms of both their natures and their effects on the body and the environment as those held by *On the Sacred Disease.*

On the Sacred Disease: the north and south winds

At the end of chapter sixteen, *On the Sacred Disease* states that the sacred disease 'is born and grows from the things that come to the body and leave it...' (Hippocrates, *On the Sacred Disease,* 13 [16 Jones] 2.25.9-10 Jouanna =L6.386.11-12) making a clear statement that the disease is brought on by external factors and their effect on the body. The treatise recognised the different natures of the winds and attempted to explain why people might be attacked by this disease at the changes of the winds.

Before this physician explains how disease in the body is caused by the change in the wind, he first describes what influences the north and south winds have on natural phenomena such as airs and waters showing their opposite effects. Only then does he describe how these winds affect the body. When describing the effects of the north wind, the author compares the effects of this wind on mankind to the effects it has on everything in the natural world:

> For the north wind contracts the air and separates from it what is turbid and damp, making it clear and transparent. It acts in the same way upon everything as well that rises from the sea or waters generally. For it separates the moist and the dull from everything, including men themselves, for which reason it is the most healthy of the winds. [442] (Hippocrates, *On the Sacred Disease,* 13 [16 Jones] 2.23.11-18 Jouanna =L6.384.8-13)[443]

[442] Ὁ μὲν γὰρ βορέης ξυνίστησι τὸν ἠέρα καὶ τὸ θολερόν τε καὶ τὸ νεφῶδες ἐκκρίνει καὶ λαμπρόν τε καὶ διαφανέα ποιέει· κατὰ δὲ τὸν αὐτὸν τρόπον καὶ τἆλλα πάντα ἐκ τῆς θαλάσσης ἀρξάμενα καὶ τῶν ἄλλων ὑδάτων· ἐκκρίνει γὰρ ἐξ ἁπάντων τὴν νοτίδα καὶ τὸ δνοφερὸν, καὶ ἐξ αὐτῶν τῶν ἀνθρώπων, διὸ καὶ ὑγιεινότατός ἐστι τῶν ἀνέμων.

[443] See Jouanna for the nature of the north wind in opposition to the south found in other texts: (2003) 102 n. 5-6.

He goes on to say that the north wind has a very similar effect on the brain:

> ...north winds press together the healthiest part of the brain, separating the most diseased and moist, and washing it out; for which reason the fluxes occur at the changes of these winds. [444] (Hippocrates, *On the Sacred Disease*, 13[16 Jones] 2.25.4-8 Jouanna=L6.386.8-12)

The north wind 'presses together'(συνίστησι) the healthiest part of the brain in the same way that it 'contracts' (συνίστασθαι) the air in the natural environment.[445] This process of contraction allows the diseased and moist part of the brain to be separated from the healthy part of the brain in the same way that the 'turbid and damp' (τὸ θολερόν τε καὶ τὸ νοτῶδες) or 'moist and dull' (τὴν νοτίδα καὶ δνοφερόν) parts of the air or water are separated off. This separation of the phlegm from the brain, through the contracting and separating power of the north wind, causes a flux in the body and brings on a fit.

The author also compares the effects of the south wind on the natural environment with the effects on the body in the same way:

> ...the action of the south wind is the opposite (to the north wind). At first it begins to melt and diffuse the condensed air, inasmuch as it does not blow strong immediately, but is calm at first, because it cannot at once master the air, that before was thick and condensed, but requires time to dissolve it. In exactly the same way it acts upon the earth, sea, rivers, springs, wells and everything that grows in which there is moisture, and moisture is in

[444] …τοῖσι δὲ βορείοισι ξυνίστασθαι τὸ ὑγιηρότατον τοῦ ἐγκεφάλου, τὸ δὲ νοσερώτατον καὶ ὑγρότατον ἐκκρίνεσθαι καὶ περικλύζειν ἔξωθεν, καὶ οὕτω τοὺς καταῤῥόους ἐπιγίνεσθαι ἐν τῇσι μεταβολῇσι τῶν πνευμάτων.

[445] The fact that the same word is used here to refer to the effect in the natural environment and in the human body emphasises how the effects are the same on both.

> everything, though more in some things than in others. All these things feel the effects of this wind, and become dull instead of bright, hot instead of cold, wet instead of dry. [446] (Hippocrates, *On the Sacred Disease,* 13 [16 Jones] 2.23.18-24.11 Jouanna= L6.384.13-22)

Here, the south wind produces a 'melting' or 'dissolving' effect. The author, by stating that the south wind has this impact on everything, implies that this melting effect also extends to the human body and in an earlier chapter the author states that the south wind melts or dissolves the phlegm in the brain, which can cause flux.[447] In chapters thirteen and sixteen, the author specifically describes the effects of the south wind on the brain:

> In other cases the cause is that the south wind, suddenly coming on after north winds, loosens and relaxes the brain when it is braced and strong, so that the phlegm overflows, and thus it produces the flux. [448] (Hippocrates, *On the Sacred Disease,* [13 Jones] 2.19.14-20.1 Jouanna=L6.378.17-380.1)

> ...of necessity a south wind relaxes and moistens the brain and enlarges the veins... [449] (Hippocrates, *On the Sacred Disease,* 13 [16 Jones], 2.25.3-4 Jouanna =L6.386.7-8)

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[446] Ὁ δὲ νότος τἀναντία τουτέῳ ἐργάζεται· πρῶτον μὲν γὰρ ἄρχεται τὸν ἠέρα ξυνεστεῶτα τήκειν καὶ διαχέειν, καθότι καὶ οὐκ εὐθὺς πνέει μέγας, ἀλλὰ γαληνίζει πρῶτον, ὅτι οὐ δύναται ἐπικρατῆσαι τοῦ ἠέρος αὐτίκα, τοῦ πρόσθεν πυκνοῦ τε ἐόντος καὶ ξυνεστηκότος, ἀλλὰ τῷ χρόνῳ διαλύει· τὸ δ' αὐτὸ τοῦτο καὶ τὴν γῆν ἐργάζεται καὶ τὴν θάλασσαν καὶ τοὺς ποταμοὺς καὶ τὰς κρήνας καὶ τὰ φρέατα καὶ ὅσα φύεται καὶ ἐν οἶσιν ὑγρὸν ἔνεστιν· ἔστι δὲ ἐν παντὶ, ἐν μὲν τῷ πλέον, ἐν δὲ τῷ ἔλασσον· ἅπαντα δὲ ταῦτα αἰσθάνεται τοῦ πνεύματος τούτου, καὶ ἔκ τε λαμπρῶν δνοφερώδεα γίνεται, ἔκ τε ψυχρῶν θερμὰ, καὶ ἐκ ξηρῶν νοτώδεα.

[447] Hippocrates, *On the Sacred Disease,* 13, l.10-15 Jones =L6.378.17-380.1.

[448]Τοῖσι μὲν αὕτη ἡ πρόφασις γίνεται, τοῖσι δὲ καὶ ἐπειδὰν ἐξαπίνης μετὰ βόρεια πνεύματα νότος μεταλάβῃ, ξυνεστηκότα τὸν ἐγκέφαλον καὶ εὐσθενέοντα ἔλυσε καὶ ἐχάλασεν ἐξαίφνης, ὥστε πλημμυρεῖν τὸ φλέγμα, καὶ οὕτω τὸν κατάῤῥοον ποιέεται.

[449]... ἀνάγκη τοῖσι μὲν νοτίοισι λύεσθαί τε καὶ φλυδᾶν τὸν ἐγκέφαλον καὶ τὰς φλέβας χαλαρωτέρας γίνεσθαι.

Here, the impact of the south wind on the brain parallels the effects of this wind on the natural environment. The south wind is 'relaxing' (ἐχάλασεν) and 'loosening' (λύεσθαί) when it is in the body and affects the brain and the vessels as well as moistening these body parts presumably by depositing some of its moisture in the body. These effects are similar to the moistening and dissolving effects produced in the natural environment.

The free movement of air about the body is essential for cognitive and bodily functions in this treatise. Intelligence flows in the air to the brain which is, according to this author, the organ with which we think, perceive, and feel. [450] An obstruction in air-flow prevents intelligence flowing to the brain and the limbs causing a fit. [451] But it is the nature of the air itself that causes a flux in the bodily humour phlegm obstructing the passages used for air-flow.

The changes in the winds, particularly the north and the south winds, can cause this type of phlegmatic flux in the body.[452] The flux, according to the author, can take place after a sudden change from hot to cold when phlegm in the brain is either 'melted' (ἀποτήκεται) by the heat or 'separated' (ἐκκρίνεται) from the rest of the brain by a sudden chill and flows down through the body.[453] It can also be caused by a 'loosening' (ἔλυσε) or a 'relaxing' (ἐχάλασεν) of the brain.

The hot and the cold nature of the two opposing winds are driving factors behind the effect they have on the moist phlegm within the brain. It is the sudden chill from the north wind that contracts the brain separating the phlegm from it, and

[450] Hippocrates, *On the Sacred Disease*, 17, 19, and 20 Jones=L6.386.15-388.11, 390.10-392.3, 392.4-394.8.
[451] Hippocrates, *On the Sacred Disease,* 8-10 Jones=L6.368.10-374.20.
[452] Hippocrates, *On the Sacred Disease,* 16 Jones=L6.384.4-386.14.
[453] Hippocrates, *On the Sacred Disease,* 13 Jones=L6.378.10-380.19.

it is the sudden heat from the south wind that causes the melting and loosening effect causing the phlegm to overflow.

The effects of the south wind are more dangerous according to this author since the winds cause the phlegm to overflow within the brain.[454] The north wind, though it is considered to be a powerful wind, does not affect the brain as much as the south wind does:

> At the changes of the winds for these reasons do I hold that patients are attacked, most often when the south wind blows, then the north wind, and then the others.[455] (Hippocrates, *On the Sacred Disease,* 13 [16 Jones] 2.23.6-9 Jouanna=L6.384.4-6)

The north wind is described as the more 'healthy' (ὑγιηρότατός) wind since it separates the more diseased parts from the healthier parts of the brain.[456] Indeed, when describing the effect a north wind has on children afflicted with the disease, the author states that it is likely that they will recover:

> When the flux takes place with the wind in the north, and is very slight and to the right, the children recover without a mark.[457] (Hippocrates, *On the Sacred Disease,* 8 [11 Jones] 2.17.18-18.1 Jouanna=L6.376.13-14)

However, when the flux occurs as the south wind is blowing, there is the chance that the child may die:

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[454] Hippocrates, *On the Sacred Disease,* 11, 13, 14 Jones=L6.374.21-376.16, 378.10-380.19, 380.20-382.18.
[455] Ἐν δὲ τῇσι μεταβολῇσι τῶν πνευμάτων διὰ τάδε φημὶ ἐπιλήπτους γίνεσθαι, καὶ μάλιστα τοῖσι νοτίοισιν, ἔπειτα τοῖσι βορείοισιν, ἔπειτα τοῖσι λοιποῖσι πνεύμασι.
[456] Hippocrates, *On the Sacred Disease,* 16, l.7-13 Jones=L6.384.8-13.
[457] Ὁκόσοισι δ' ἂν βόρειόν τε καὶ πάνυ ὀλίγον παραῤῥυῇ καὶ ἐς τὰ δεξιὰ, ἀσήμως περιγίνονται.

> Little children when attacked by this disease generally die, if the flow come on copious and with a south wind; for the minor veins being thin cannot admit the phlegm because of its thickness and abundance, but the blood is chilled and congeals, causing death.[458] (Hippocrates, *On the Sacred Disease,* 8 [11 Jones] 2.16.24-17.4 Jouanna =L6.374.21-376.2)

The north and south winds play a vital role where the flux is concerned as they are a factor in determining whether the flux will kill a sufferer or whether they escape without a mark.

According to this treatise, the north and south winds have this effect on the phlegm in the brain because of their nature. The body feels the effects of the winds because it interacts with and is an integral part of the natural environment. Brooke Holmes discusses how this author uses the verb αἰσθάνεσθαι 'to sense' when referring to the wind's effect on objects in the natural world and its effect on the body. She explains that 'sensing in these instances does not coincide with sentience but describes, rather, physical interaction with the environment.'[459] I would go further suggesting that the winds enter the body and change the nature of its make-up because their natures extend to the nature of the physical body, which in turn changes its bodily processes and brings on disease. This is because the human body parallels the natural world and changes with the changes taking place in the natural environment.

This treatise offers explanations for why two opposing winds can cause a single affliction that is the sacred disease. It also discusses the general effects of the north

[458] Καὶ ὁκόσα μὲν παιδία σμικρὰ κατάληπτα γίνεται τῇ νούσῳ ταύτῃ, τὰ πολλὰ ἀποθνήσκει, ἢν πουλὺ τὸ ῥεῦμα ἐπιγένηται καὶ νότιον ἔῃ· τὰ γὰρ φλέβια λεπτὰ ἐόντα οὐ δύναται παραδέχεσθαι τὸ φλέγμα ὑπὸ πάχεος καὶ πλήθεος, ἀλλ' ἀποψύχεται καὶ πήγνυται τὸ αἷμα, καὶ οὕτως ἀποθνήσκει.
[459] Holmes (2010) 109-11.

and south winds on both mankind and the natural environment and does not confine itself to the explanation of the sacred disease. The explanation of these different effects of the north and south winds in relation to theories concerning their natures that this treatise offers is important for understanding the references to the impact of the different winds in other Hippocratic treatises because many treatises offer remarks about the type of conditions that these winds bring on but they do not explain why these effects occur.[460] By comparing these descriptions of diseases brought on by the north and south wind in other Hippocratic texts to the explanation of the effects of the winds in *On the Sacred Disease,* it is reasonable to suggest that a similar set of connections is at work concerning the nature and effects of the winds throughout the Hippocratic Corpus.

The nature of the winds and the nature of the diseases caused

In addition to *On the Sacred Disease,* there are scattered references to the effects that the winds have on the human body and, more often than not, the nature of the winds and their effects are similar if not identical to those found in *On the Sacred Disease.* The three main texts treated here will be *Aphorisms*, *Humours,* and *Airs, Waters, Places* since they offer a comprehensive schema for the effects of the winds on the human body but other texts such as part of the *Epidemics* will be brought in.[461]

In the third section of the *Aphorisms,* there is a theory regarding the north and south winds similar to that in *On the Sacred Disease.* However, the nature and effects of the winds are not described to any extent in *Aphorisms*. Instead, it is stated that the characteristics of these winds (νότοι) 'extend to those suffering from

[460] Generally the effects of the north wind are not described in as much detail as the descriptions of the south wind: see Jouanna (2003) 105 n.5. I would suggest that this is because the south wind was considered more dangerous than the north owing to its capacity to augment moisture.
[461] The treatises are all roughly contemporary see Craik (2015) 11, 34, 90-1, 134, 195.

illnesses' (Hippocrates, *Aphorisms,* III, 5, l.2-3 Jones= L4.488.2-3)[462] and we can only deduce what nature these winds have from the types of illness they produce. The case is the same in the Hippocratic treatise *Humours* where the same points about the effects of the north wind and the south wind are made. Again, the treatise *Airs, Waters, Places* offers a schema for the effects of the winds on different cities and their inhabitants and by comparing this treatise to *On the Sacred Disease,* we can shed some new light on why some cities suffer from particular diseases.

To treat the nature and effects of the south wind in these Hippocratic treatises first, the author of *Aphorisms* states that the south wind causes '...deafness, dimness of vision, heaviness of the head, torpor,' and that they are 'relaxing,'(Hippocrates, *Aphorisms* III, 5, l.1-2 Jones=L4.488.1-2).[463] The author of the Hippocratic treatise *Humours,* who also describes both the nature of the winds and their effect on the human body, makes the same point about the south wind as the author of *Aphorisms* does:

> South winds cause deafness, dimness of vision, headaches, heaviness, and are relaxing. When such winds prevail, their characteristics extend to sufferers from diseases.[464] (Hippocrates, *Humours,* 14, l.1-2 Jones=L5.496.1-3) [465]

Here, the only description provided regarding the effect of the south wind is 'relaxing' (διαλυτικοί). But we can also see that the south wind produced a type of

[462] ... ὁκόταν οὗτος δυναστεύῃ, τοιαῦτα ἐν τῇσιν ἀῤῥωστίῃσι πάσχουσιν.
[463]Νότοι βαρυήκοοι, ἀχλυώδεες, καρηβαρικοὶ, νωθροὶ, διαλυτικοί· ... LSJ s.v. δισλῦτικός has the general meaning of 'being able to sever' but medically comes to mean 'relaxing.' One could suggest a possible parallel with *On the Sacred Disease* and the effects produced by the north wind that separates the unhealthy parts of the brain from the healthier parts causing the flux to run down through the veins. See above p.137-8 The *Index Hippocraticus* states that δισλῦτικός is only found in *Aphorisms* and *Humours* see Index Hippocraticus s.v. δισλῦτικός.
[464] Νότοι βαρυήκοοι, ἀχλυώδεες, καρηβαρικοὶ, νωθροὶ, διαλυτικοί· ὅταν οὗτος δυναστεύῃ, τοιουτότροπα ἐν τῇσι νούσοισι πάσχουσιν.
[465] Humours has the same passage word for word as *Aphorisms*, this may suggest a popular saying or line of thought in the Hippocratic Corpus.

mugginess or lack of clarity in the human body whereby it caused deafness and dimness in vision. The author of *On the Sacred Disease* maintained that the south wind has the power to obscure and change the shape of things. This even extends to the heavenly bodies, making them dull instead of bright.[466] It is not certain here whether the author is referring to the clarity of the atmosphere that obscures the heavenly bodies or whether it is the heavenly bodies themselves that are dulled. The detrimental effect that the south wind has on the vision and hearing outlined in *Aphorisms* and *Humours* can be compared to the lack of clarity in the natural world described in *On the Sacred Disease* indicating that the mugginess of the south wind is the same or at least roughly similar for all of these treatises.

The author of *Humours* also extends his description to the effect that the south wind has on parts of the body that have sores:

> Sores are soft, especially in the mouth, the genitalia, and similar places.[467] (Hippocrates, *Humours*, 14, l.3-4 Jones=L5.496.2-3)

Here, the effect of this wind can be compared to the effects of warm water on sores discussed above suggesting that the wind is both moist and warm.[468] This passage can also be compared to the observation made in *Epidemics* II where the author notes that continuous, violent rains occurred more with winds from the south and this was the cause of watery sores on the skin.[469] In these treatises, it can reasonably be suggested that the south wind is conductive to moisture and is warm in its nature producing both a warming and moistening effect on the body.

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[466] Hippocrates, *On the Sacred Disease*, 16, l.14-32 Jones=L6.384.13-386.4.
[467] ἕλκεα μαδαρὰ, μάλιστα στόμα, αἰδοῖον, καὶ τἆλλα.
[468] See above pp.88-9.
[469] Hippocrates, *Epidemics* II, 1.1 Smith=L5.72.1-5.

The south wind in these texts has the same moistening, warming and relaxing effect as in *On the Sacred Disease.* The illnesses described can be attributed to the moist nature of the south wind or its power to promote the accumulation of moisture in the air. In these treatises, the diseases that are already prevalent are said to take on the same characteristics as the south wind paralleling this natural phenomenon in its nature.

Again, the description of the effects of the south wind in *Airs, Waters, Places* is similar to the effects described in *On the Sacred Disease* where the author states that the relaxing, moistening, and heating nature of the south wind causes the flux from the brain into the vessels.[470] In comparison, the treatise *Airs, Waters, Places* states that in a city where the hot winds prevail, that is, those that blow from the south, the inhabitants are moist and full of phlegm:[471]

> A city that lies exposed to the hot winds...when subject to these and sheltered from the north winds...The heads of the inhabitants are moist and full of phlegm, and their digestive organs are frequently deranged by the phlegm that runs down into them from the head.[472] (Hippocrates, *Airs, Waters, Places,* 3, 2.189.16-190.10 Jouanna=L2.14.21-16.7)

Later on, the author describes how in men, dysentery and diarrhoea are listed among the diseases that the author later attributes to the looseness of the bowels suggesting

[470] Hippocrates, *On the Sacred Disease,* 16, l.14-42 Jones= L6.384.13-386.11.
[471] The hot winds are winds blowing from a southerly direction from between the winter rising and setting of the sun, which is roughly between the directions east-south-east and west-south-west. See Loeb introduction: Jones (1923) 69; Hippocrates, *Airs, Waters, Places,* 3, l.3-11 Jones =L2.14.21-16.6.
[472] Ἥτις μὲν πόλις πρὸς τὰ πνεύματα κέεται τὰ θερμά…καὶ αὐτέη ταῦτα τὰ πνεύματά ἐστι ξύννομα, τῶν δὲ ἀπὸ τῶν ἄρκτων πνευμάτων σκέπη…τούς τε ἀνθρώπους τὰς κεφαλὰς ὑγρὰς ἔχειν καὶ φλεγματώδεας, τάς τε κοιλίας αὐτέων πυκνὰ ἐκταράσσεσθαι, ἀπὸ τῆς κεφαλῆς τοῦ φλέγματος ἐπικαταῤῥέοντος.

a relaxing effect of the wind again. [473] Moreover, children are said to be liable to convulsions, the sacred disease and asthma in a south wind.[474] Children, like women, are more moist in nature and the attacks of convulsions and the sacred disease may be for the reason that the wind has a moistening and relaxing effect augmenting the moisture within them. [475]

The asthmatic complaint in children mentioned here is more interesting as the cause could be a number of reasons associated with the south wind. For example, in *On the Sacred Disease,* the author attributes the cause of asthma to an obstruction caused by phlegm occurring in the veins that carry the breath near the heart, an effect that can be attributed to the effects on the south wind on the phlegm.[476] However, in *Airs, Waters, Places* the south wind brings on a moist, thick atmosphere which, when breathed in, has a detrimental effect on the breathing and voice and this is the more likely explanation for the asthmatic complaint. For example, the author discusses the effect of the atmosphere on the voice of the Phasians and the inhabitants of a city exposed to the west winds who are always breathing in a thick 'turbid' atmosphere and who have particularly deep voices.[477]

This flux brought on by the south wind not only extends to the digestive organs in *Airs, Waters, Places* but also to the reproductive organs and fertility of women who are generally prone to excessive fluxes in such a climate.[478] Indeed, a woman's constitution was generally seen to be more moist than a man's in the

[473] Hippocrates, *Airs, Waters, Places,* 3, l.23-24 Jones=L2.18.5-6.
[474] Hippocrates, *Airs, Waters, Places,* 3, l.21-3 Jones =L2.18.4-5; it should be noted that asthma literally translates as a difficulty in breathing and should not be associated with the asthmatic complaint we recognise today.
[475]Hippocrates, *On Regimen* I, 33, l.2-4 Jones=L6.510.24-512.1; In addition, the elderly are drier in ancient theories in general: see p.110 n.352. Women and children also suffer the effects of the moon in both Aristotle and the Hippocratic Corpus because they are moist in nature: see below pp.173-179.
[476] Hippocrates, *On the Sacred Disease,* 9, l.1-12 Jones=L6.370.12-20.
[477] Hippocrates, *Airs, Waters, Places,* 6, 15 Jones=L2.24.10-26.8, 60.9-62.12.
[478] Hippocrates, *Airs, Waters, Places,* 3, l.18-21 Jones=L2.18.2-4.

Hippocratic Corpus and an excess of moisture in a woman can bring on many diseases.[479] The author here states that women become barren through disease and that abortions are frequent. Indeed, there is a danger that too much moisture present in a woman's uterus can cause barrenness according to the Hippocratic author of *On Barrenness.*[480] Thus, the moistening effect of the south wind in this city has a detrimental effect on females as it increases the moistness of their already moist constitution.

There is one exception in the Hippocratic Corpus to this view that the south wind has a moistening effect and that is found in *On Regimen* II which states that a warm wind can be parching. Here, the wind has lost all of its moisture in hot lands where it has been absorbed by the sun and is hot and dry causing it to draw moisture to itself rather than bring moisture with it thus parching the inhabitants.[481] However, the general view found in the Hippocratic Corpus is that the warm winds or south winds are heavy with moisture and have a particularly moistening effect on the body.

Where the north wind is concerned, in *On the Sacred Disease* this wind produces contraction and a sort of seizing up which in turn causes separation of moist from dry, dull from bright, and diseased from healthy. It makes the air 'clear and transparent' and 'washes out' the diseased and moist part of the brain. [482] In short, it produces a clearing effect in opposition to the mugginess that the south wind produces. In *Airs, Waters, Places* a city that is exposed to the cold north wind, is home to inhabitants that are described as generally lean, sinewy and hard.[483] This ties

[479] Lloyd (1964) 102; Hippocrates, *On Regimen* I, 27, l.2-5 Jones=L6.500.2-4.; *Airs, Waters, Places,* 3 L18-19 Jones=L.2.18.2-3 See pp. 66. n.200 for the moistness of women and for women counted among those with moist constitutions.
[480] Hippocrates, *On Barrenness,* 1 Potter= L8.412.11-22.
[481] Hippocrates, *On Regimen* II, 38, l.29-55=L6.532.5-534.1.
[482] See pp.137-8.
[483] Hippocrates, *Airs, Waters, Places,* 4, l.8-11 Jones=L2.18.23-20.2.

in with the contracting nature of the north wind described in *On the Sacred Disease*, the coolness of which can harden, brace or strengthen objects within the body such as the brain.[484] Moreover, the inhabitants of this cold city in *Airs, Waters, Places* have 'healthy' (ὑγιηρός) heads, which can be compared to the 'healthy' (ὑγιηρός) nature of the north wind and its separating effects where the diseased, moist parts of the brain are separated from the healthier parts in *On the Sacred Disease*.[485]

Some of the ailments caused by the cold and the cold north wind are stiffness in the lower digestive organs caused by a general hardness and contraction in the body in *Airs, Waters, Places.*[486] These examples can be compared to *Aphorisms* III where the north wind causes '...coughs, sore throats, constipation, difficult urination accompanied by shivering, pains in the sides and the chest...'[487] (Hippocrates, *Aphorisms* III, 5, l.4-5 Jones=L4.488.3-6) The diseases listed here, I would suggest, are a result of a contraction of the body, which is an effect that the north wind has on everything in the natural world, according to *On the Sacred Disease.*

Though the nature of the wind and the effect it has on the human body is not explained to any extent in *Humours, Aphorisms* or in *Airs, Waters, Places* as it is in *On the Sacred Disease,* the ideas about the powers and effects of the north and south winds are much the same. In each treatise, the different natures of the north and south wind extend to the human body creating diseases that parallel the winds in their natures. The south wind is moistening and warming causing a predominance of

[484] Hippocrates, *On the Sacred Disease,* 13, 16 Jones =L6.378.10-380.19, 384.4-386.14.
[485] Hippocrates, *Airs, Waters, Places,* 4, l.12-13 Jones=L2.20.2-3; *On the Sacred Disease,* 16, l.7-13 Jones=L6.384.8-13.
[486] Hippocrates, *Airs, Waters, Places,* 4, l.16-21 Jones=L2.20.6-9.
[487] βῆχες, φάρυγγες, κοιλίαι σκληραὶ, δυσουρίαι φρικώδεες, ὀδύναι πλευρέων, στηθέων ὁκόταν οὗτος δυναστεύῃ, τοιαῦτα ἐν τῇσιν ἀῤῥωστίῃσι προσδέχεσθαι χρή.

phlegm and creating a certain mugginess in the human body and the north wind is chilling and stiffening but clarifying causing a healthy separation of the diseased parts of the body but bringing on diseases associated with contraction such as sore throats and difficulty in bowel movements.

When exploring the different texts that discuss the effect of the winds and atmosphere on the human body, one can recognise certain parallels that exist between the texts. When these texts are put together it becomes clear that the views concerning the effect of the winds and other atmospheric phenomena on the human body did not vary to a great degree. By examining the treatise *On the Sacred Disease* and comparing it to other Hippocratic treatises we see that there is a general view in medical writing held about the nature of the winds and their differing effects on the human body. In the treatises *Aphorisms* and *Humours* where the effects of the winds are simply stated with no explanation we can see why these winds bring on particular ailments when we examine them in conjunction with *On the Sacred Disease.* Also, by examining the effect that the winds had on the human body in *On the Sacred Disease*, we can better understand the schematic system put forward in *Airs, Waters, Places* for the effects of the winds on the inhabitants of the differently positioned cities.

To summarise, the schema for the north and south winds put forward in the Hippocratic Corpus and their effects on both the natural environment and the human body is based around the opposites hot, cold, wet, and dry. The human body parallels the natural environment in its reaction to the winds because the same relationship between moisture, heat, and air exists in the human body as in the natural world. The south wind is a hot wind making it highly conductive to moisture. In the natural environment, it brings moisture to the land making everything more dull and moist

in nature. The same effect is found in the human body where the phlegm is augmented by the moisture of the wind and by the heat, which warms the brain causing it to loosen, relax and melt. In addition, the warm and moist nature of this wind causes dimness of vision, heaviness, and deafness. The exception to this is found in *On Regimen* II where the south wind can be parching because it has lost its moisture in other lands and attracts moisture to itself from everything it comes into contact with due to the ability heat has to attract moisture to itself.

The effects of the north wind are the opposite. The north wind is cold and has a clarifying effect. In the natural environment, the atmosphere and waters are clarified by this wind since what is moist and dull is separated from the clear and brighter parts. In the human body, the diseased and moist parts of the brain are separated from the healthier parts. However, this wind can also have a stiffening and hardening effect causing leanness and diseases such as difficulty in urinating and constipation. For a comparison between the effects of the north wind and the effects of the south on the human body see Table 2.3 below.

Table 2.3: A comparison between the effects of the north and south wind on the human body and the natural environment.

	Natural environment	Human body
North wind	• Cold • Separates and clears waters • Contracts	• Chills/braces • separates and clears fluids e.g. phlegm • Stiffens/contracts innards e.g. causes constipation and difficulty in urination
South wind	• Warm • Creates mugginess and lack of clarity • Augments moisture	• Warms/softens • Causes dimness of vision and deafness • Brings moisture to the innards and the skin

Conclusions

The body parallels the effects of the wind on the natural environment because the same relationship between heat, moisture and air exist both in the body and in the natural environment. Air is sometimes drawn into the body by the body's internal heat and heat also attracts moisture to itself. The nature of the air entering the body depends on the winds. Air or breath travels through the vessels moistening bodily fluids and loosening organs in a south wind or contracting and separating fluids in the body in a north wind. The same effects of the wind can be observed in the natural environment particularly in waters where waters can either be cleared by a north wind or increased by a south wind that brings much moisture with it because the relationship between heat, moisture and breath or winds exists in the human body as in the natural environment.

By understanding the nature of the winds and the effects they cause in both the natural world and the human body described in *On the Sacred Disease* and comparing them to descriptions in other Hippocratic treatises, it becomes clear that the schematised characters of the winds and their effects are generally the same throughout the Hippocratic Corpus. The nature of the different winds is extended to the human body in these texts where the winds dictate the nature of the diseases. The north wind is cold, clearing and contracting producing diseases in the human body that are associated with stiffness in the bodily organs, chilling or bracing the body or it could produce healthiness in the body by separating out the unhealthy parts of the innards. The south wind is hot, moist, and is not clarifying like the north wind and produces diseases that come from an excess of moisture in the body, softness, and causes deafness and dim vison.

The general views about how heat and moisture work in the micro-/macrocosm are maintained by the Hippocratic physicians and also by Aristotle when discussing the effects of the sun and moon on both the natural environment and the human body. But the heat from the heavenly sphere can act differently and have different effects to the heat we find in waters and the atmosphere and this has an impact on both the body and natural phenomena.

The heavens: sun and moon

In this section, the heat from the heavens and the heavenly bodies and their effects on the natural environment and the human body will be explored. In the previous sections we saw how heat always draws moisture to itself in both the human body and the natural world sometimes causing a drying effect and how cold can cause a moistening effect because it does not have this power. We have also seen how heat can play an important role in generation in Chapter one. These arguments are important for this section since it will in the main investigate the heat emanating from the heavens and the heavenly bodies in its generative and non-generative capacity. In the first part of this section, the effects of heat from the sun on the human body and the natural environment will be explored where it is in excess, deficient, and temperate. The main texts used will be *Airs, Waters, Places, Aphorisms,* and *On the Nature of Man* because they all offer explanations for the effects of heat linked to the seasons or the effect of the sun.[488] Aristotle's *Meteorology* will also be brought i-n for a discussion of scorching since ideas found in *Airs, Waters, Places* have parallels to Aristotelian theories related to inconcoction.

In the second part, the effects of the moon's heat will be considered as a weaker sun particularly on women since women along with moist constituations are the only people discussed when the effects of the moon are explained. The main texts used will be the Hippocratic gynaecological works *Eight Months' Child* and *On the Nature of the Child*, which are roughly contemporary in date.[489] The third part will briefly explore the effects of heat on the mind examining the similarities and differences in explanations between the ps.-Aristotelian *Problems* and the

[488] The treatises listed date from the mid-late fifth century BC: Craik (2015) 11, 34, 212.
[489] *On the Nature of the Child* is likely to date to the late fifth century and *Eight Months' Child* to the early fourth century Craik (2015) 118 and 250.

Hippocratic *Airs, Waters, Places*. This section will concentrate mainly on texts from the Hippocratic and Aristotelian Corpus since the ideas presented in both are strikingly similar and Aristotle's explanations go some way to offering explanations for Hippocratic ideas.

1. The heat of the sun

Excessive heat from the heavenly bodies and the drying effect

Excessive heat from the sun in the summer time or in a hot country had a drying effect on both the land and the inhabitants. As we have seen in the discussion of winds and waters, heat attracts moisture to itself in the Hippocratic Corpus. This happens both in the natural world and inside the body. The sun does not behave differently; it attracts the finest part of moisture to itself, which dries out the land and human bodies.[490] For example, in *Airs, Waters, Places,* the author describes how the sun draws moisture from everything that contains moisture and that there is, in fact, moisture in everything:

> To begin with, the sun raises and draws up the finest and lightest part of water, as is proved by the formation of salt...Not only from pools does the sun raise this part, but also from the sea and whatever has moisture in it – and there is moisture in everything. Also, from men themselves it raises the finest and lightest part of their juices. [491] (Hippocrates, *Airs, Waters, Places,* 8, 2.204.12-205.5 Jouanna=L2.32.3-34.3)[492]

[490] Hippocrates, *Airs, Waters, Places,* 8 Jones=L2.32.17-36.19; Aristotle, *Meteorology,* II, 2 354b26-27.

[491] τήν τε γὰρ ἀρχὴν, ὁ ἥλιος ἀνάγει καὶ ἀναρπάζει τοῦ ὕδατος τό τε λεπτότατον καὶ κουφότατον· δῆλον δὲ οἱ ἅλες ποιέουσιν· τὸ μὲν γὰρ ἁλμυρὸν λείπεται αὐτέου ὑπὸ πάχεος καὶ βάρεος, καὶ γίγνεται ἅλες· τὸ δὲ λεπτότατον ὁ ἥλιος ἀναρπάζει ὑπὸ κουφότητος· ἀνάγει δὲ τὸ τοιοῦτο οὐκ ἀπὸ τῶν ὑδάτων μοῦνον τῶν λιμναίων, ἀλλὰ καὶ ἀπὸ τῆς θαλάσσης, καὶ ἐξ ἁπάντων ἐν ὁκόσοισιν ὑγρόν τέ

The sun dries out the land and its waters by taking away the finest and lightest part of the moisture that is in everything including the human body.

When the sun is strongest in the summer months, the dryness in the body brings on different diseases associated with the dry. The author of *Aphorisms* sums up the diseases that occur in summer time when the sun is strongest and there are some parallels with the effects of particularly dry weather:

> In summer occur some of the diseases just mentioned, and also continuous fevers, ardent fevers, tertian fevers, vomiting, **diarrhoea** (διάῤῥοια) **eye diseases** (ὀφθαλμίαι), pains of the ears, ulcerations of the mouth, putrefaction of the genitals, sweats. [493] (Hippocrates, *Aphorisms* III, 21 Jones=L4.494.20-496.3)
>
> ...In droughts occur consumption, **eye diseases** (ὀφθαλμίαι), diseases of the joints, strangury and **dysentery** (δυσεντερίαι). [494] (Hippocrates, *Aphorisms* III, 16, l.4-6 Jones=L4.492.9-12)

Here, the same diseases associated with the summer are also associated with dry weather suggesting that the summer time is akin to a very dry time of year. This dryness in the weather extends to the nature of diseases. The eyes diseases mentioned here are a product of dry weather because they are naturally moist in nature and so would suffer in dry weather. Dysentery could be seen as a purging of

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ἐστιν· ἔνεστι δὲ ἐν παντὶ χρήματι· καὶ ἐξ αὐτέων τῶν ἀνθρώπων ἄγει τὸ λεπτότατον τῆς ἰκμάδος καὶ κουφότατον.

[492] See n. 155 above for the fact that this was a widely held theory in Ionian cosmology.

[493] Τοῦ δὲ θέρεος, ἔνιά τε τουτέων, καὶ πυρετοὶ ξυνεχέες, καὶ καῦσοι, καὶ τριταῖοι πλεῖστοι, καὶ ἔμετοι, καὶ διάῤῥοιαι, καὶ ὀφθαλμίαι, καὶ ὤτων πόνοι, καὶ στομάτων ἑλκώσιες, καὶ σηπεδόνες αἰδοίων, καὶ ἵδρωα.

[494] ἐν δὲ τοῖσιν αὐχμοῖσι, φθινάδες, ὀφθαλμίαι, ἀρθρίτιδες, στραγγουρίαι, καὶ δυσεντερίαι.

moisture leaving the body dry.[495] Here, the heat of the weather is drying the body out purging it of moisture in the same way that the sun draws moisture from the natural environment in hot weather and droughts.

In hot, dry weather there is also a particular emphasis on the occurrence of fevers in the Hippocratic treatises. For example, in *Epidemics* II states that fevers come on with hot weather and describes how burning fever is drier in summer, presumably making it worse:

> Burning fevers[496] occur more in summer; they occur in other seasons but they are drier in summer.[497] (Hippocrates, *Epidemics*, II, 1.2 l.5-7 West=L5.72.9-11)

In the third *katastasis* of *Epidemics* I, the description of the year stresses how dry it was and the description of diseases notes the prevalence of fevers. [498] This can be compared to the effect of abnormally dry weather on the body in the treatise *Aphorisms* where we see that fevers are also predominant in this type of weather:

> In droughts occur acute fevers; and if the year should be particularly dry, according to the constitution (κατάστασις)[499] it has produced, such for the

[495] For protecting the eyes against all forms of dryness see *On the Use of Liquids*, 6 Potter = L6.13214-15.
[496] καῦσος can also mean bilious fever emphasising again that this fever is very dry. Bile is the dry humour that rises in summer according to *On the Nature of Man* for example: *On the Nature of Man*, 7, l.31-33 Jones =L.6.48.9.
[497] Οἱ καῦσοι ἐν τῇσι θερινῇσι μᾶλλον γίνονται, καὶ ἐν τῇσιν ἄλλῃσιν ὥρῃσιν, ἐπιξηραίνονται δὲ μᾶλλον θέρεος.
[498] Hippocrates, *Epidemics* I, 13-15, 18-20 and 24-26. Jones =L2.638.7-646.9, 650.9-664.10, 670.16-682.2. For a full discussion of the *katastaseis* see p. 220-30.
[499] This could refer to both the 'constitution' of the weather and the 'constitution' of the body. See pp.220-1 for a full discussion of this term.

most part will be the diseases that must be expected. [500] (Hippocrates, *Aphorisms* III, 7 Jones=L4.488.9-12)

Again, fevers occur in summer in particular according to the treatise *On the Nature of Man* because fevers come from bile. [501] An excessive drying of the body occurs in summertime in particular when the sun is at its strongest and this causes bile to predominate in the body over the summer and autumn:

> And in summer blood is still strong, and bile rises in the body and extends until autumn. In autumn blood becomes small in quantity, as autumn is opposed to its nature, while bile prevails in the body during the summer season and during the autumn.[502] (Hippocrates, *On the Nature of Man,* 7, 184.3-7 Jouanna=L6.48.4-9)[503]

This treatise states that heat plays a large part in bringing fevers on owing to the abundance of bile in the body:

> Now what is called the continuous fever comes from the most abundant and purest bile, and its crises occur after the shortest interval. For since the body has no time to cool it wastes away rapidly, being warmed by the great heat.[504] (Hippocrates, *On the Nature of Man,* 15, 202.13-204.1 Jouanna=L6.66.13-16)

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[500] Ἐν τοῖσιν αὐχμοῖσι πυρετοὶ ὀξέες γίνονται· καὶ ἢν μὲν ἐπὶ πλέον ᾖ τὸ ἔτος τοιουτέον ἐὸν, οἵην τὴν κατάστασιν ἐποίησεν, ὡς ἐπιτοπουλὺ καὶ τὰ νουσήματα τοιαῦτα δεῖ προσδέχεσθαι.

[501] Hippocrates, *On the Nature of Man,* 15, l.1 Jones=L6.66.10.

[502] τοῦ δὲ θέρεος τό τε αἷμα ἰσχύει ἔτι, καὶ ἡ χολὴ ἀείρεται ἐν τῷ σώματι καὶ παρατείνει ἐς τὸ φθινόπωρον· ἐν δὲ τῷ φθινοπώρῳ τὸ μὲν αἷμα ὀλίγον γίνεται, ἐναντίον γὰρ αὐτέου τὸ φθινόπωρον τῇ φύσει ἐστίν· ἡ δὲ χολὴ τὴν θερίην κατέχει τὸ σῶμα καὶ τὸ φθινόπωρον.

[503] But, 'autumn' (φθινόπωρον or μετόπωρον from φθιν- meaning decay or waning or μετά meaning 'after' or a 'change' and ὀπώρα meaning late summer) has the transitional sense of the period following on and connected to summer.

[504] Ὁ μὲν οὖν ξύνοχος καλεόμενος γίνεται ἀπὸ πλείστης χολῆς καὶ ἀκρητεστάτης, καὶ τὰς κρίσιας ἐν ἐλαχίστῳ χρόνῳ ποιέεται· τὸ γὰρ σῶμα οὐ διαψυχόμενον οὐδένα χρόνον συντήκεται ταχέως, ἅτε ὑπὸ πολλοῦ τοῦ θερμοῦ θερμαινόμενον.

Here, the body is wasting away (συντήκεται) owing to the heat since it does not cool down. This suggests that the moisture of the body is being dried up since it is the moisture within a body that is important for growth.[505]

The Dog Star was also associated with part of the year when fevers would attack or change their nature since it marked the onset of late summer and the particularly hot and dry weather. In Hesiod and Homer the Dog Star is blamed for the drying effect and for the fevers that attack the body at this time of year. In Homer, the Dog Star was a star that was thought to bring or signal the onset of great heat in late July as well as fevers:[506]

> The old man Priam was first to see him with his eyes,/As he sped all gleaming over the plain/ Like the star that comes up at harvest time, and brightly do its rays/ Shine among the many stars in the dead of night,/ The star that men call by name the Dog of Orion./ Brightest of all is he, yet he is a sign of evil,/ And brings much fever on wretched mortals.[507] (Homer, *Iliad,* 22.25-31)

In Hesiod, the Dog Star has a drying effect along with the heat it brings on:

> ...for Sirius parches their head and knees/And their skin is dry from the heat.[508] (Hesiod, *Works and Days*, 587-8)[509]

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[505] As we have seen, moisture is nutriment or is the vehicle of nutriment in the body: see above p.101 n.311.
[506] For a discussion of the Dog star in religious cult, Homer, Hesiod and the Hippocratic Corpus see Langholf (1990) 168-9.
[507] Τὸν δ' ὃ γέρων Πρίαμος πρῶτος ἴδεν ὀφθαλμοῖσι /παμφαίνονθ' ὥς τ' ἀστέρ' ἐπεσσύμενον πεδίοιο,/ὅς ῥά τ' ὀπώρης εἶσιν, ἀρίζηλοι δέ οἱ αὐγαὶ/φαίνονται πολλοῖσι μετ' ἀστράσι νυκτὸς ἀμολγῷ,/ὅν τε κύν' Ὠρίωνος ἐπίκλησιν καλέουσι./λαμπρότατος μὲν ὅ γ' ἐστί, κακὸν δέ τε σῆμα τέτυκται, /καί τε φέρει πολλὸν πυρετὸν δειλοῖσι βροτοῖσιν.
[508] ἐπεὶ κεφαλὴν καὶ γούνατα Σείριος ἄζει,/αὐαλέος δέ τε χρὼς ὑπὸ καύματος.
[509] The name Σείριος is used for the Dog Star here rather than κύων meaning dog: LSJ s.v. κύων.

The Hippocratic physicians hold a strikingly similar idea to those put forward in Homer and Hesiod but offer a natural explanation as to why fevers may occur or cease at the rising of this star based on the changes in the weather when the heat of late summer generally comes on. In Hippocratic thought it is not clear whether the Dog Star causes the heat or not. The rising of this star seems to act only as a marker for the beginning of a change in weather since there is no direct statement to say whether heat comes directly from this star or not.[510] This may indicate a change in views concerning the effects of the Dog Star where Hippocratic physicians attribute the excessive heat to the sun or the season rather than to the Dog Star itself. For example, in the *Epidemics,* the Dog Star marks the beginning of increased summer heat[511] and is associated with fever or the time when fevers change specifically.[512] In *Airs, Waters, Places,* the Dog Star does not necessarily bring heat and dryness since fevers may cease if there is rain and stormy weather at its rising. This suggests that the predominance of moisture is what causes fevers to cease since fevers are caused by dry weather.[513]

Excessive heat from the sun causes excessive drying in both the natural environment and the human body. This occurs during seasons such as summer, where the sun is strongest, and during a particularly dry year where the drying effect of the heat is felt strongly. The body is reflecting the dry climate and the land around it both of which are parched by the heat. The body's dryness can be seen through the diseases that manifest during this type of weather such as diarrhoea where moisture is purged from the body, eye diseases suggesting moist parts of the body are irritated by the dry, and fevers that are brought on specifically in dry weather. The effect is

[510] Langholf (1990) 168.
[511] Hippocrates, *Epidemics,* I, 13, l.8-9 Jones=L.2.640.3-4.
[512] Hippocrates, *Epidemics,* VII, 1, l.1 West =L5.364.1.
[513] Hippocrates, *Airs, Waters, Places,* 10, l.5-8 Jones=L2.42.9-11.

the opposite when the heat of the sun is not strong and the opposing kinds of diseases begin to take hold. Instead, a moistness prevails in both the natural environment and the human body and the lack of heat produces a pale and sickly nature.

Deficient heat and the moistening effect

In *Airs, Waters, Places,* the deficiency of heat caused a moist and cold climate and a general moistness in the natural environment. For example, in *Airs, Waters, Places,* the city facing the west does not benefit from the sun's heat for very long and mist and fog form over the water and dissolve into it.[514] Again, in a land such as the Scythian plain, the climate is moist and cold because winter is 'perennial' and the sun is only felt at the summer solstice and then only for a short time. In this land, there are many large rivers and a moist atmosphere with a thick fog.[515] This moist, cold atmosphere is akin to the nature of winter where the climate is cold and moist since the sun is not strong.[516]

This moistness caused by the cold can be seen in the human body in the Hippocratic treatises and parallels can be drawn between the natural phenomena brought on by the cold in the environment and the diseases that arise in the human body as a result of the cold. In winter or in a land where there was an abundance of mist and fog, moist, cold humours such as phlegm were augmented. According to *On the Nature of Man,* phlegm is the coldest humour and the most viscid. For these reasons it is the humour that predominates in winter because it is most akin to

[514] Hippocrates, *Airs, Waters, Places,* 4, l.6-10 Jones=L2.18.22-20.1.
[515] Hippocrates, *Airs, Waters, Places,* 19, l.9-20 Jones=L2.20.1-8.
[516] Hippocrates, *On the Nature of Man,* 7, l.1-4, l.l.45-8 Jones=L6.46.9-3, 60.13-15.

winter.[517] In other treatises, winter ailments are associated with wet and cold or phlegmatic conditions such as coughs and colds. For example, in a year that proved moist and cold resembling winter recorded in the second *katastasis* of the *Epidemics,* coughs are noted to have come on as well as convulsions and copious sweats reflecting the cold, damp nature of winter.[518] Again, if we compare a passage in *Aphorisms* describing winter diseases to other passages in *Aphorisms* describing the effects of cold and wet weather conditions there are distinct parallels to be made:

> In winter occur pleurisy, pneumonia, colds, sore throat, **coughs** (βῆχες**), pains in the chest** (πόνοι στηθέων) and in the sides and loins, headache, dizziness, apoplexy. [519] (Hippocrates, *Aphorisms,* III, 23 Jones =L4.496.9-11)

> Cold things, such as snow or ice, are **harmful to the chest**, (τῷ στήθεϊ πολέμια) and provoke **coughing**, (βηχέων κινητικὰ) discharges of blood and catarrhs. [520] (Hippocrates, *Aphorisms* V, 24 Jones=L4.540.12-13)

The conditions associated with the cold and the wet have direct parallels with those diseases that occur in winter. The cold causes contraction in both the natural environment and the human body and it could be suggested that this effect brings on the coughing. Also, these diseases are associated with and abundance of phlegm in the body that parallels the cold and damp nature of winter.

The best example of the effects of a cold and moist climate on both the natural environment and on the human body can be seen in *Airs, Waters, Places*

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[517] Hippocrates, *On the Nature of Man*, 7, l.1-6 Jones=L6.46.9-11.
[518] Hippocrates, *Epidemics* I, 4-7 Jones=L2.614.6-638.7
[519] Τοῦ δὲ χειμῶνος, πλευρίτιδες, περιπλευμονίαι, κόρυζαι, βράγχοι, βῆχες, πόνοι στηθέων, πόνοι πλευρέων, ὀσφύος, κεφαλαλγίαι, ἴλιγγοι, ἀποπληξίαι.
[520] Τὰ ψυχρὰ, οἷον χιὼν, κρύσταλλος, τῷ στήθεϊ πολέμια, βηχέων κινητικὰ, αἱμοῤῥοϊκὰ, καταῤῥοϊκά. This treatise also states that diseases such as apoplexy can arise from rainy weather: Hippocrates, *Aphorisms* III, 16 Jones=L4.492.9-12. Catarrhs also occur in winter in the *Epidemics*: *Epidemics* V, 72 West=L5.432.16-17.

where the lack of heat in the west-facing city has a detrimental effect on both the land and the human body. Indeed, if we examine the sun's effect on waters of this city the waters do not receive much heat from the sun until later in the day after the morning mist has dissolved into the waters:

> In the first place, the waters are not clear, the reason being that in the morning mist[521] is generally prevalent, which dissolves in the water and destroys its clearness, as the sun does not shine on it before it is high on the horizon.[522] (Hippocrates, *Airs, Waters, Places*, 6, 2.198.5-8 Jouanna = L2.24.13-16)

Here, the sun does not shine on the waters early enough or for a long enough period of time to clear them nor to prevent precipitation like mist dissolving into them and polluting them.[523] There are also heavy dews and rains leading to an unhealthy atmosphere in this city.[524] The sun does not shine on the land for a long enough period of time to remove moisture and prevent an unhealthy moist nature prevailing in both the waters and the land. This lack of sunshine also makes the inhabitants of this city the most unhealthy of all the other cities described in this treatise.[525]

The inhabitants of the west-facing city are affected in the same way by the lack of sunshine. They are described as 'without colour' (ἀχρόους)[526] because the sun 'scorches' (διέψω) them:[527]

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[521] The Greek here is ἠὴρ most likely meaning 'mist.' See above for a discussion of this term and see Jouanna (1996) 266-7 n.6 for further discussion in relation to the use of this term further on in the same chapter.
[522] πρῶτον μὲν γὰρ τὰ ὕδατα οὐ λαμπρά· αἴτιον δὲ, ὅτι ὁ ἠὴρ τὸ ἑωθινὸν κατέχει ὡς ἐπὶ τὸ πουλὺ, ὅστις τῷ ὕδατι ἐγκαταμιγνύμενος τὸ λαμπρὸν ἀφανίζει· ὁ γὰρ ἥλιος πρὶν ἄνω ἀρθῆναι οὐκ ἐπιλάμπει.
[523] Cf.unhealthy stagnant and marsh water pp.104-115.
[524] Hippocrates, *Airs, Waters, Places*, 6, l.10-22 Jones=L2.24.13-26.5.
[525] Hippocrates, *Airs, Waters, Places*, 6, l.14-16 Jones=L2.24.19-20
[526] LSJ s.v. ἀχρόους. Jouanna compares this effect to the effect of the sun on stagnant waters where both are discoloured: (1996) 266 n.3 and 269 n.7.

> In the summer cold breezes blow in the morning and there are heavy dews; for the rest of the day the sun as it sinks in the west thoroughly scorches the inhabitants. Thus, it is likely that they are without colour and sickly and subject to all the previously mentioned diseases, for none is ruled out for them. [528] (Hippocrates, *Airs, Waters, Places*, 6, 2.198.8-13 Jouanna =L2.24.13-20)

At first glance it could be argued that the inhabitants are being dried out or burnt by the sun as it crosses to the west because it is scorching them. However, 'scorching' in the thought of the ancient philosophers and physicians is a process whereby there is only enough heat to affect the surface of something very much like the modern term 'to sear.' For example, Aristotle describes scorching in relation to 'inconcoction' (ἄπεπτος) which is brought about by the cold.[529]

> Inconcoction is due to cold and its species are rawness (ὠμότης), parboiling (μώλυσις), scorching (στάτευσις).[530] (Aristotle, *Meteorology*, IV, 2 379b12-13) [531]

'Inconcoction' is a state which is in an 'imperfect state due to lack of proper heat' and occurs when the moisture in something is not mastered by the proper or internal

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[527] The word διέψω means to scorch thoroughly in relation to the effect of the sun as it nears the west: LSJ s.v. διέψω. Jouanna translates this as 'brûle'. It is true that the διά in διέψω could mean cook thoroughly; but διά in compounds may mean partially cooked and here it is most probable that it refers to scorching or searing or some form of partial cooking since the sun takes an effect on the inhabitants only for a short period nearer to the end of the day. According to the Index Hippocraticus the only place this word is found is in this passage of *Airs, Waters, Places*: Index Hippocraticus s.v. διέψω.

[528] Τοῦ δὲ θέρεος, ἕωθεν μὲν αὖραι ψυχραὶ πνέουσι, καὶ δρόσοι πίπτουσιν· τὸ δὲ λοιπὸν ἥλιος ἐγκαταδύνων ὥστε μάλιστα διέψει τοὺς ἀνθρώπους, διὸ καὶ ἀχρόους τε εἰκὸς εἶναι καὶ ἀῤῥώστους, τῶν τε νοσευμάτων πάντων μετέχειν μέρος τῶν προειρημένων· οὐδὲν αὐτέοισιν ἀποκέκριται.

[529] LSJ s.v. ἄπεπτος. This term generally refers to something that is uncooked or undigested or crude. It can also be found in the Hippocratic texts: *Epidemics* I, 2, l.23 Jones=L2.608.7; *On Ancient Medicine*, 19, l.35 Jones=L1.618.11; *Regimen in Acute Diseases*, 42, l.7 Jones=L2.314.2.

[530] ψυχρότητος δὲ ἀπεψία, ταύτης δὲ ὠμότης, μόλυνσις, στάτευσις.

[531] The term ὠμότης is very similar to that of ἄπεπτος literally meaning rawness, indigestion or crudity. The term μώλυσις can refer to the process of boiling or simmering and suggests that the boiling process is incomplete resulting in parboiling: LSJ s.v. ὠμότης, ἄπεπτος and μώλυσις. The term στάτευσις means to scorch: LSJ s.v. στάθευσις.

heat of an object or a body.[532] Aristotle does not describe scorching in relation to the progress of the sun and he uses the word στάτευσις**.** However, it is useful to compare the process referred to in *Airs, Waters, Places* and that described in Aristotle since both associate scorching with cold rather than heat and both cause an incomplete state. In *Airs, Waters, Places*, scorching is referring to a lack of heat where the heat of the sun only affects the inhabitants for a short period of time. The scorching process has an effect whereby the inhabitants are burnt on the surface by the sun but the lack of heat as the sun moves west means that the heat burns them superficially. They are effectively blanched by the heat of the sun making them imperfect.

We can compare this process to that occurring in the natural environment where the sun in the west-facing city is not shining on the land for long enough to conquer the moisture which results in a moist, foggy atmosphere. The same thing is happening with the inhabitants where the heat of the sun is not shining on them for long enough to bring about health. In the west-facing city, the sun is 'scorching' the inhabitants just touching the surface of them as it is doing with the waters since it is not shining on them for a prolonged period of time.

The excess and deficiency of heat in different seasons and places due to the strength or weakness of the sun has profound and opposite effects on both the land and the body. The excess of heat from the sun draws moisture from the land making the environment dry. In the human body, heat from the sun has a parallel effect causing dryness in the body, which in turn causes diseases associated with dryness such as bowel problems and fevers. The deficiency of heat causes a moist, foggy atmosphere

[532] Aristotle, *Meteorology* IV, 2 380a6; *Meteorology* IV, 2 379b33.

where the waters are polluted by mist. In the human body, this climate cause paleness and sickliness in the inhabitants as well as a moist temperament. This can bring on diseases associated with moist and cold such as convulsions, coughing, and a general excess of phlegm.

The sun's effects were not always detrimental since a temperate climate could be produced by the sun's warmth during the spring time.[533] This type of climate generally had excellent effects on both body and is particularly associated with the blood and generation, as we shall see next.

Temperate climate

In the Hippocratic Corpus the sun sometimes brought on a temperate climate when the spring approached.[534] The climate was warm but the sun was not yet strong enough to dry everything completely meaning that the climate was also moist from the winter before causing balance in temperature and moisture levels.[535] The treatise *Airs, Waters, Places* compares the city that faces the east to a climate very like springtime because of its temperate nature.[536] Again, it is stated that the climate of Asia is very similar to spring time as it has a very temperate climate where there is no excess of hot, cold, wet or dry:

> While it is not burnt up with the heat nor dried up by drought and want of water, it is not oppressed with cold, nor yet damp and wet with excessive

[533] It should be noted that some authors believed the spring time to be a season characterised by change and therefore a dangerous time for diseases. However, many believed that it was a temperate season and therefore a healthy season, for example: Hippocrates, *On the Sacred Disease*, 13, l.33-34 Jones=L6.380.14-15.
[534] It must be noted that this is not always the case in the Hippocratic Corpus and some authors believe spring to be a dangerous time characterised by change: *On the Sacred Disease*, 13, l.33-34 Jones=L6.380.14-15*; Aphorisms* III, 20 Jones=L4.494.16-19*;* cf. *Aphorisms* III, 22 Jones=L4.496.4-8.
[535] Spring as a moist and warm climate: Hippocrates, *On the Nature of Man*, 7, l.17-23 Jones=L6.46.20-48.3.
[536] Hippocrates, *Airs, Waters, Places*, 5 Jones=L2.22.15-24.9.

> rains and snow...This region, both in character and in the mildness of its seasons, might fairly be said to bear a close resemblance to spring...[537] (Hippocrates, *Airs, Waters, Places*, 12, 2.221.1-222.1 Jouanna =L2.54.7-56.1)

Here, the seasons do change but they are very mild changes and so the climate is temperate.

Spring is often associated with the onset of rain and is considered a moist and warm time of year. Hesiod describes the spring as the 'season of rain' and *Airs, Waters, Places* also describes spring as a season when the rains come on.[538] The treatise *On the Nature of Man* describes the spring time as when 'the cold relaxes.'[539]

Since spring has a warm and moist nature it was associated with blood, which also had a warm and moist nature.[540] For example, the author of *On the Nature of Man* associates spring with the predominance of blood in the body because the blood has the same qualities as the spring:

> And in spring too phlegm still remains strong in the body, while the blood increases. For the cold relaxes, and the rains come on, while the blood accordingly increases through the showers and the hot days. For these conditions of the year are most akin to the nature of blood, spring being moist

[537] Οὔτε γὰρ ὑπὸ τοῦ θερμοῦ ἐκκέκαυται λίην, οὔτε ὑπὸ αὐχμῶν καὶ ἀνυδρίης ἀναξηραίνεται, οὔτε ὑπὸ ψύχεος βεβιασμένη· ἐπεὶ δὲ καὶ διάβροχός ἐστιν ὑπό τε ὄμβρων πολλῶν καὶ χιόνος…εἰκός τε τὴν χώρην ταύτην τοῦ ἦρος ἐγγύτατα εἶναι κατὰ τὴν φύσιν καὶ τὴν μετριότητα τῶν ὡρέων.
[538] Hesiod, *Works and Days*, 492; Hippocrates, *Airs, Waters, Places*, 10, l.9-10 Jones=L2.42.11-12.
[539] Hippocrates, *On the Nature of Man*, 7, l.17-23 Jones=L6.46.20-48.3.
[540] The word for spring ἔαρ (contacted ἦρ is the usual form in the Hippocratic Corpus except in *Aphorisms*) and a word for blood ἔαρ are identical in ancient Greek. The Etymologicum Magnum makes this connection: *EM* 307.44.

and warm...[541] (Hippocrates, *On the Nature of Man,* 7, 182-15-19 Jouanna= L6.46.20-48.3)

In *Aphorisms,* there is an abundance of blood in the body during the spring as the author advises bleeding in this season:

> When it is beneficial to practice venesection, one ought to bleed in the spring.[542](Hippocrates, *Aphorisms* VII, 53 Jones=L4.592.9-10)

The predominance of blood in the body during the spring time parallels the nature of the season, which is moist and warm. This can be seen in the nature of the diseases that occur during spring. The treatises *Aphorisms* and *On the Nature of Man* sum up the diseases associated with the spring and many of them are associated with blood, moisture, or they are brought on by warmth:

> In spring occur melancholia, madness, epilepsy, bloody flux, sore throat, colds, sore throats, coughs, skin eruptions and diseases, eruptions turning generally to ulcers, tumours and affections of the joints. [543] (Hippocrates, *Aphorisms* III, 20 Jones=L4.494.16-19)

> It is chiefly in spring and summer that men are attacked by dysenteries, and by haemorrhage from the nose, and they are then hottest and red.[544] (Hippocrates, *On the Nature of Man,* 7, 182.19-184.2 Jouanna=L6.48.3-5)

[541] Τοῦ δὲ ἦρος τὸ φλέγμα ἔτι μένει ἰσχυρὸν ἐν τῷ σώματι, καὶ τὸ αἷμα αὔξεται· τά τε γὰρ ψύχεα ἐξανίει, καὶ τὰ ὕδατα ἐπιγίνεται, τὸ δὲ αἷμα κατὰ ταῦτα αὔξεται ὑπό τε τῶν ὄμβρων καὶ τῶν θερμημεριῶν·κατὰ φύσιν γὰρ αὐτέῳ ταῦτά ἐστι μάλιστα τοῦ ἐνιαυτοῦ· ὑγρόν τε γάρ ἐστι καὶ θερμόν.
[542] Ὁκόσοισι ξυμφέρει αἷμα ἀφαιρέεσθαι ἀπὸ τῶν φλεβῶν, τουτέοισι ξυμφέρει ἦρος φλεβοτομέεσθαι.
[543] Τοῦ μὲν γὰρ ἦρος, τὰ μανικὰ, καὶ τὰ μελαγχολικὰ, καὶ τὰ ἐπιληπτικὰ, καὶ αἵματος ῥύσιες, καὶ κυνάγχαι, καὶ κόρυζαι, καὶ βράγχοι, καὶ βῆχες, καὶ λέπραι, καὶ λειχῆνες, καὶ ἀλφοὶ, καὶ ἐξανθήσιες ἑλκώδεες πλεῖσται, καὶ φύματα, καὶ ἀρθριτικά.
[544] οἱ ἄνθρωποι τοῦ ἦρος καὶ τοῦ θέρεος μάλιστα ὑπό τε τῶν δυσεντεριῶν ἁλίσκονται, καὶ ἐκ τῶν ῥινέων τὸ αἷμα ῥεῖ αὐτέοισι, καὶ θερμότατοί εἰσι καὶ ἐρυθροί.

It is worth having a closer look at *Aphorisms* here because there are parallels between the types of diseases listed and the nature of the weather. Ulceration of the skin is listed amongst the diseases and it could be argued that this is caused by heat and moisture where the skin is made soft.[545] The eruption of the skin brought on by moisture is emphasised and can be compared to the effects of a moist atmosphere listed in other treatises. For example, the excessive rains of one season in the *Epidemics* caused swellings of the skin.[546] The sacred disease is also mentioned and can be compared to the effects of the warm and moist south wind in *On the Sacred Disease.*[547] Also, as a hang-over from the winter months there are diseases associated with phlegm and moisture such as colds and coughs.[548]

The body is again acting as a microcosm of the universe in its reflection of the natural environment where the hot and moist blood becomes predominant paralleling the onset of rains and warmth in the natural world during the spring time. Diseases associated with both warmth and moisture such as ulceration of the skin, swellings, and diseases associated with blood such as haemorrhages are prevalent because the weather is warm and moist and affects the body entirely. In short, the diseases listed for the spring time in the Hippocratic Corpus have distinct parallels with the nature of the season they occur in.

Another strong association with the temperate climate of the spring time is that of conception and childbirth. The idea that spring is associated with blood, the moist and the warm explains why some authors believed the spring to be a good time for generation. For example, the author of *On Barrenness* states that 'spring is the

[545] Hippocrates, *Aphorisms* V, 16 Jones =L4.536.14-16; cf. warm water on the skin above pp.88-9.
[546]Hippocrates, *Epidemics*, II, 1.1, l.1-6 West=L5.72.1-5 and again cf. the effect of warm water on the skin above pp.88-9.
[547] See above pp.137-43.
[548] Cf. Hippocrates, *Aphorisms* III, 23 Jones=L.4.496.9-11.

best time for becoming pregnant' (Hippocrates, *On Barrenness*, 6 Potter=L8.422.18-22 [218L]). This could be an association with growth, which is just beginning in spring since spring is generally a time for new life. However, it could also stem from the fact that spring was associated with blood and the need for blood within a woman to produce life since menstrual blood was considered the material from which a human body could be made.[549] For example, the menstrual fluid had to be both moist and warm for life to be created and these qualities had to be in equal measure otherwise conception would not take place: [550]

> Women do not conceive who have the womb dense and cold; those who have the womb watery do not conceive, for the seed is drowned; those who have the womb over-dry and very hot do not conceive, for the seed perishes through lack of nourishment. But those whose temperament is a just blend of the two extremes prove able to conceive.[551] (Hippocrates, *Aphorisms* V, 62 Jones =L4.554.12-556.1-2)

According to this treatise, the same concept can be applied to the male seed:

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[549] See above for menstrual blood and generation: pp.66-8. It should also be noted that in Aristotle, blood was important for growth since food was concocted into blood by the vital heat and this fluid flowed to the parts of the body providing the material that makes up the body and maintains it: Aristotle, *Parts of Animals* III, 5 668a20-22; *On Sleep* 3 456a30-34. Cf. Plato 'blood is the nutriment of the flesh and the whole body': Plato, *Timaeus*, 80d-81a.

[550] The idea that equality is important for growth is echoed in *Airs, Waters, Places* it is stated that 'Growth and gentleness are most fostered when there is no extreme, but a balance of powers' (Hippocrates, *Airs, Waters, Places*, 12, l.16-19 Jones=L2.54.1-3) τὴν δὲ αὔξησιν καὶ ἡμερότητα παρέχει πλεῖστον ἁπάντων, ὁκόταν μηδὲν ᾖ ἐπικρατέον βιαίως, ἀλλὰ παντὸς ἰσομοιρίη δυναστεύῃ. The author adds that in a place such as Asia where the climate is so temperate, there are good harvests from both the seed and those that spontaneously grow from the earth, which indicates that conditions are right for both reproduction and spontaneous generation. In addition, animals grow into 'very fine creatures' and 'bring forth the sturdiest young' suggesting that a temperate climate like spring is best for growth and for young creatures (Hippocrates, *Airs, Waters, Places*, 12, l.32-5 Jones=L2.54.13-15).

[551] Ὁκόσαι ψυχρὰς καὶ πυκνὰς τὰς μήτρας ἔχουσιν, οὐ κυΐσκουσιν· καὶ ὁκόσαι καθύγρους ἔχουσι τὰς μήτρας, οὐ κυΐσκουσιν, ἀποσβέννυται γὰρ ὁ γόνος· καὶ ὁκόσαι ξηρὰς μᾶλλον καὶ περικαέας, ἐνδείῃ γὰρ τῆς τροφῆς φθείρεται τὸ σπέρμα· ὁκόσαι δὲ ἐξ ἀμφοτέρων τὴν κρᾶσιν ἔχουσι ξύμμετρον, αἱ τοιαῦται ἐπίτεκνοι γίνονται.

> Similarly with males. Either because of the rarity of the body the breath is borne outwards so as not to force along the seed; or because of the density of the body the liquid does not pass out; or through the coldness it is not heated so as to collect at this place; or through the heat this same thing happens.[552] (Hippocrates, *Aphorisms* V, 63=L4.556.3-7)

As a time of year that was warm and moist and in balance we may assume that these conditions in the natural environment would help create the best conditions in the human body for generation to take place.

In the treatise *Airs, Waters, Places,* the author makes the link between spring-like conditions and reproduction. The following passage describes a city that faces the east with a very temperate climate:

> A city so situated is just like spring, because of its moderation in respect of heat and cold; the diseases, while resembling those which we said occur in cities facing the hot winds, are both fewer and less severe. The women there very readily conceive and have easy deliveries.[553] (Hippocrates, *Airs, Waters, Places,* 5, 2.197.6-12 Jouanna =L2.24.4-9)

Here, the author associates the temperate climate of spring with conception and birth suggesting that the climate plays a part in producing the right conditions for this to take place.

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[552] Παραπλησίως δὲ καὶ ἐπὶ τῶν ἀῤῥένων· ἢ γὰρ διὰ τὴν ἀραιότητα τοῦ σώματος τὸ πνεῦμα ἔξω φέρεται πρὸς τὸ μὴ παραπέμπειν τὸ σπέρμα· ἢ διὰ τὴν πυκνότητα τὸ ὑγρὸν οὐ διαχωρέει ἔξω· ἢ διὰ τὴν ψυχρότητα οὐκ ἐκπυροῦται, ὥστε ἀθροίζεσθαι πρὸς τὸν τόπον τοῦτον· ἢ διὰ τὴν θερμασίην τὸ αὐτὸ τοῦτο γίνεται.

[553] Ἔοικέ τε μάλιστα ἡ οὕτω κειμένη πόλις ἦρι κατὰ τὴν μετριότητα τοῦ θερμοῦ καὶ τοῦ ψυχροῦ· τά τε νοσεύματα ἐλάσσω μὲν γίγνεται καὶ ἀσθενέστερα, ἔοικε δὲ τοῖσιν ἐν τῇσι πόλεσι γιγνομένοισι νοσεύμασι, τῇσι πρὸς τὰ θερμὰ τὰ πνεύματα ἐστραμμένῃσιν. Αἵ τε γυναῖκες αὐτόθι ἀρικύμονές εἰσι σφόδρα, καὶ τίκτουσι ῥηϊδίως.

A temperate climate is brought on in the spring time when the sun is becoming stronger but there is still a moistness in the environment left from winter. The body reflects these conditions where blood, as the moist and warm humour, becomes strong in the body and diseases associated with warmth and moisture such as eruptions on the skin become prevalent. Owing to the strong association with blood, moisture and warmth, the spring is considered a good time to conceive or bear children since the body reflects its natural environment and becomes balanced in temperature and moisture. In connection to this, there are strong associations between the nature of spring and the full moon as both times are moist and warm times of the year. This time when the moon was full was considered the best time to conceive as it was thought the warmest and moistest time of the month.

2. The effects of the moon

According to Aristotle, the moon was considered a weaker version of the sun. It produced heat but not as strongly as the sun and it waxed and waned bringing heat then cold within the timeframe of a month, rather than within the timeframe of a year:

> …when the month is waning…the month is colder and moister because of the waning and failure of the moon; as the sun makes winter and summer in the year as a whole, so does the moon in the month. This is not due to the

turning of the moon, but it grows warmer as the light increases and colder as it wanes.[554] (Aristotle, *Generation of Animals,* IV, 2 767a2-6)

A micro-/macrocosm model can be seen between the body of woman and the moon where the menstrual cycle parallels the moon's cycle because women react to the changes in heat brought on by the moon. According to the author of the Hippocratic *Eight Months' Child* 'the menses in a healthy woman appear monthly, since the month has its own particular power in their bodies.'[555] (Hippocrates, *Eight Months' Child*, 9 Potter=L7.448.6-7) In this treatise, the author associates a woman's menstrual pattern with the temperature of the month:

> First blood is stirred up in their body of necessity each month because one month differs greatly from another month, both in its coldness and its heat, and a woman's body senses this, since it is moister than a man's...[556] (Hippocrates, *On the Nature of the Child*, 4 Potter=L7.494.10-13)[557]

The beginning of the menstrual cycle coincides with the new moon and in the middle of the month, i.e. at the full moon, is when conception generally takes place. Menstruation happens when the moon is waxing rather than waning because most women conceive after menstruation according to this treatise:

> ...since for most women, it must necessarily be after the menses that they become pregnant, after the evacuation passes. Accordingly, you should allow a woman the portion of the month in which the cleaning itself will be taking

[554] τὸ γίγνεσθαι δὲ τὰ καταμήνια κατὰ φύσιν φθινόντων τῶν μηνῶν μᾶλλον διὰ τὴν αὐτὴν αἰτίαν συμβαίνει. Ψυχρότερος γὰρ ὁ χρόνος οὗτος τοῦ μηνὸς καὶ ὑγρότερος διὰ τὴν φθίσιν καὶ τὴν ἀπόλειψιν τῆς σελήνης· ὁ μὲν γὰρ ἥλιος ἐν ὅλῳ τῷ ἐνιαυτῷ ποιεῖ χειμῶνα καὶ θέρος, ἡ δὲ σελήνη ἐν τῷ μηνί.

[555] ὡς ἔχοντος τοῦ μηνὸς ἰδίην δύναμιν ἐν τοῖσι σώμασιν.

[556] Πρῶτα μὲν ταράσσεται τὸ αἷμα ἐν τῶ σώματι κατὰ μῆνα ἕκαστον, ὑπὸ ἀνάγκνς τοιῆσδε, ὅτι μὴν μηνὸς πολυ διαφέρει καὶ κατὰ ψύξιν καὶ κατὰ θερμασίν, καὶ τούτου αἰσθάνεται τῆς γυναικὸς τὸ σῶμα, ὑγρότερον γάρ ἐστιν ἢ τὸ τοῦ ἀνδρός.

[557] For a discussion of this passage and the effect of climatic factors in this treatise in relation to other treatises of the fifth and fourth centuries that treat the effect of heat and cold on the body see Lonie (1981) 169-70.

> place, and this time, in women whom it is least, is three days, but in most women it is many days more...You must also consider most especially in these calculations that when the new moon is one day old, this is very close to one thirtieth on the month...Now for all these reasons, most women must necessarily become pregnant around the middle of the month, or beyond that...[558] (Hippocrates, *Eight Months' Child*, 13 Potter=L7.458.19-460.5)

The idea that she is purging the matter from which a human body is made at the colder time of the month is significant since this time could be considered a particularly bad time for reproduction and life in general.[559]

Indeed, there might be another explanation for why menstruation should occur at the coldest time of the month. As we saw above in the first section of this thesis, menstrual blood is considered to have parallels with the earth that the semen then endows with vital heat giving this matter form and life.[560] Could this blood coincide with the coldest part of the month because it becomes too cold and therefore heavy and tends downwards as all earthy matter does in the theories of Aristotle and the treatise *On Fleshes* since they want to reach their natural place?[561] Indeed, according to Aristotle, it is the natural heat in man that is so strong and that tends upwards to such an extent that it causes him to be the only fully upright animal in the *scala naturae*.[562] The fact that the tendency of an element such as heat plays such a

[558] πλείστησι τῶν γυναικῶν ἀναγκαῖόν ἐστιν ἐν γαστρὶ λαμβάνειν μετὰ τὰ καταμήνια, ἢ ἴη ἡ λύσις. δεῖ τοίνυν τῇ γθναικὶ χρόνον δοῦναι τοῦ μηνός, ἐν ᾧ αὐτὴ ἡ κάθαρσις ἔσται, καὶ ὁ χρόνος οὗτος, ἥσιν ἐλάχιστος γίνεται, τρεῖς ἡμέραι, τῆσι δὲ πλείστησι καὶ πολὺ πλείονες...χρὴ δ'ἐν τοῖσι μάλιστα καὶ τόδε λογίζεσθαι, ὅτι ἡ νεομηνίη μίη ἡμέρη ἐοῦσα ἐγγύτατον τριηκοστημόριόν ἐστι τοῦ μηνός, αἱ δὲ δύο ἡμέραι σχεδὸν πεντεκαιδεκατημόριον τοῦ μηνός...ἐκ τούτων οὖν ἀναγκαῖόν ἐστι τῆσι πλείστησι τῶν γυναικῶν περὶ διχομηνίην ἐν γαστρὶ λαμβάνειν καὶ πορρωτέρω.
[559] Dean-Jones (1994) 100.
[560] See pp. 66-7.
[561] Aristotle, *On Generation and Corruption* II, 3 330b31-33. Hippocrates, *On Fleshes* 2 l.7-8 Potter =L8.584.13-14.
[562] Heat tending upwards in animals: Aristotle *On Sleep* 3, 456b21f; For heat making the body erect: Aristotle, *Parts of Animals*, III, 6 669b5-6; Freudenthal (1995) 55-8.

vital role in Aristotle's theories means it is not unfeasible that the downward tendency of an element like earth should not play a similar role in the human body.

The temperature change brought on by the moon within a month impacts on women in particular and this causes their menstrual cycle to coincide with the cycle of the moon as it waxes and wanes. It is responsible for bringing about a cold period that causes menstruation to occur and it brings about a warmer period that creates good conditions for conception and generation to take place.

The idea that the full moon is a good time for generation to occur is also found in Aristotle. In his *History of Animals*, Aristotle describes how testaceans are furnished with eggs at certain times of year and how the edible urchin always has eggs but 'it is furnished with them in especial abundance in warm weather or when a full moon is in the sky...' (Aristotle, *History of Animals* V, 11 544a19-20) For Aristotle, the heat emanating from the moon was the same type of heat that emanated from the sun and this type of heat played a part in all generation:[563]

> ...the full moon and her disappearance and the halves of the times between these, for it is by these that the moon's orbit fits in with that of the sun, the month being a period common to both. The moon is a first principle because of its connection with the sun and its participation in its light, being as it were a second smaller sun, and therefore she contributes to all generation and development. For heat and cold varying within certain limits make things come into being and after this to perish, and it is the motions of the sun and

[563] See above for the sun's heat playing a generative role. pp.58-62.

> moon that fix the limit both of the beginning and of the end of these processes.[564] (Aristotle, *On the Generation of Animals,* V, 10 777b20-31)

Owing to the fact that the moon did not have the same strength as the sun in terms of its heat, I would suggest that the full moon is the time when the moon is giving out the most heat but moisture is still prevalent in the natural world because it does not produce enough heat to dry it up. As such, the full moon produces moisture and heat levels that can be compared to those in the spring time where the heat is not yet strong enough to bring on a drying effect like that found in the summer months. This goes some way to explaining why the full moon was thought to be the best time for conception to take place within the month and was the time when spontaneous generation might take place.[565]

The moon is also responsible diseases in certain constituations that feel the changes brought on by this heavenly body. Women feel the change in climate brought on by the moon because they are moist in nature according to *Eight Months' Child.* In relation to these ideas, different human bodies with more moist constitutions also feel the effects of the temperature change caused by the phases of the moon. For example, Aristotle associates convulsions with the full moon stating that they become worse in children at this time of the month:[566]

> Children are very commonly subject to convulsions...this malady is worst at the full moon... (Aristotle, *History of Animals,* VII, 12 588a3-10)

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[564] εἰσὶ δὲ περίοδοι σελήνης πανσέληνός τε καὶ φθίσις καὶ τῶν μεταξὺ χρόνων αἱ διχοτομίαι· κατὰ γὰρ ταύτας συμβάλλει πρὸς τὸν ἥλιον· ὁ γὰρ μεὶς κοινὴ περίοδός ἐστιν ἀμφοτέρων. ἔστι δὲ ἡ σελήνη ἀρχὴ διὰ τὴν πρὸς τὸν ἥλιον κοινωνίαν καὶ τὴν μετάληψιν τὴν τοῦ φωτός· γίγνεται γὰρ ὥσπερ ἄλλος ἥλιος ἐλάττων· διὸ συμβάλλεται εἰς πάσας τὰς γενέσεις καὶ τελειώσεις. αἱ γὰρ θερμότητες καὶ ψύξεις μέχρι συμμετρίας τινὸς ποιοῦσι τὰς γενέσεις, μετὰ δὲ ταῦτα τὰς φθοράς· τούτων δ' ἔχουσι τὸ πέρας καὶ τῆς ἀρχῆς καὶ τῆς τελευτῆς αἱ τούτων κινήσεις τῶν ἄστρων.

[565] For the different levels of heat and moisture brought on by the moon see Preaux (1973)130.

[566] Preaux (1973) 92.For a fuller description of diseases brought on by the moon in Greek thought see Preaux (1973) 91-4.

I would suggest that this is because children, like women, are more moist in their natures and so also feel the changes brought by the moon more.[567]As we saw above, convulsions especially in relation to the sacred disease are associated with a phlegmatic flux in *On the Sacred Disease* and this is often brought on by change in the weather affecting the fluids in the body.[568]

An explanation as to why only moist constitutions sense the change in temperature brought on by the moon may lie in the particular impact that heat and cold has on waters and fluids in the body. Owing to the fact that the moon's heat is significantly less than the sun's, the body must be particularly sensitive to temperature change in order to sense it. The change from hot to cold has a particular impact on waters in the natural world and fluids in the human body where heat attracts moisture and often augments fluid and the cold contracts, separates and has a drying effect.[569] It is possible that the more excess fluid contained within a body the more sensitive and more likely it is to react to temperature change because of the impact of heat on moisture. This would explain why women and children are affected at the full moon because of their moist constitutions. Those with drier constituations such as men are not affected by the phases of the moon because the heat is not strong enough for them to react and they do not have an excess of fluids to sense this heat change.

The temperature changes brought on by the phases of the moon within a month are similar to those brought about by the sun within a year but the moon's heat is weaker. As such, the full moon contributes to generation and conception by creating

[567] See p.110 n. 352.
[568] See above p.137-143.
[569] See section on bathing and on winds: pp.89-91 and pp.119-128.

warmer conditions that are also moist because it does not have the power to dry up the natural environment or the human body. The temperature change brought on by the moon can only be felt by those with a moist nature such as women and children. This suggests that the excess of moisture in their bodies is what is effected by the change in temperature since temperature change has a profound impact on moisture in both the natural world and the human body.

The nature of the climate brought about by excess, deficient, or balanced heat played an important part in the nature of disease and had a profound effect on generation and reproduction. The physical body reacted to the nature of its climate paralleling the natural environment, which can be seen in the nature of diseases caused. This physical impact of temperature and temperature change brought on by the heavenly bodies and impacting the physiology of the body could also have an impact on the mental condition of the human since there was a continuum between physical body and mind. Owing to the fact that physical parts of the human were related to psychological functions, any impact on the body had an effect on the mental condition resulting in the human body paralleling its natural environment in its mental functions as well as its physical.

3. Temperature and the effects on the mind

In both Hippocratic and Aristotelian texts the effect of change extends to the mental state of the human because there is a continuum between physical body and psychological processes or mind.[570] For the author of *On the Sacred Disease,* the air

[570] See van der Eijk (2005) 125-9 for a discussion of this idea where lists of psychological phenomena are listed and associated with physiological phenomena. For further discussion of the mind-body

taken in by the body is what carries the intelligence and a physical blocking of air causes the body to fit because intelligence cannot flow to the different parts. In *On Breaths,* a similar link between the intelligence and the physical body can be seen where the blood carries the intelligence and fits are caused when blood is blocked by air in the veins.[571] For both Hippocratic treatises, any change in the human body brought on by the natural environment not only impacts on it physically but also mentally because there is a continuum between the physical body and the intelligence. In the theories of Aristotle, the heart is the seat of the intelligence or the soul and it is also the centre of the vital heat and the blood, which makes the soul susceptible to changes in the heat.[572] Owing to the physiological links to the psychological phenomena, the physical processes that occur in the human body that parallel those in the natural environment have an impact on the mental processes.

The intelligence or moving principle is very much associated with the heavenly sphere and the heat in the climate has a profound effect on the mental state. Heat from the heavenly sphere is associated with heat in the human body that is vital to life in theories concerning reproduction and generation. Heat from the natural environment is what initiates the formation of mankind from the earth in *On Fleshes.*[573] The heat in the body becomes the moving principle and parallels the 'divine heat' that exists in the heavenly sphere. [574] For Aristotle, heat from the heavenly sphere can cause spontaneous generation in the earth.[575] Again, the soul for Aristotle is synonymous with the material of the stars which are a product of the

problem in Hippocratic treatises see Singer (1992) 131-143. For a discussion of Aristotle's theory of physico-psychological where heat 'informs' matter see Freudenthal (1995) 40-5.
[571] Hippocrates, *On Breaths,* 14, l.24-64 Jones=L6.112.9-114.12. For a comparison between the cause of fits in *On the Sacred Disease* and in *On Breaths* see van der Eijk (2005) 131-2.
[572] Ahonen (2014) 73. Aristotle, *Movement of Animals,* 8-10, 701b33-703b2 and *On Youth and Old Age,* 3-4, 468b16-469b20.
[573] Hippocrates, *On Fleshes,* 3 l.1-10 Potter=L.8.584.1-586.7.
[574] Hippocrates, *On Fleshes,* 6 Potter=L8.592.1-594.5.
[575] See above pp.60-2.

ignition of fine air synonymous with vital heat and πνεῦμα.[576] Thus, the nature of the vital heat within the human body is synonymous with that found in the heavenly sphere. The heat emanating from the heavenly sphere dictates the nature of the climate and has an impact on the physiology of the body, which in turn has an impact on the mental state.

In *Airs, Waters, Places*, the physical human body is not the only factor when the nature of the human is explained, there are also references to the impact of the climate on the mental state. For example, it is the violent change in seasons that causes a more enduring and more war-like character due to the mental shocks.[577] Also, those people inhabiting the east-facing city have a better 'temper and intelligence' in comparison to inhabitants of a north-facing city, according to *Airs, Waters, Places*.[578] The same treatise states that the people in a land characterised by temperance such as Asia are 'thick-witted' in the arts probably because they are not industrious enough to pursue them.[579] These people are generally less war-like and are often ruled by kings because their temperate climate makes them lazy.[580] An explanation for this may lie in the physical processes related to intelligence such as taking breath into the body and how temperature works with the human body. We saw above that there is a close relationship between moisture, heat, and air in the natural world and in the human body and this relationship crosses the boundaries of the human body where the powers move in and out of it. Air and moisture are drawn to heat causing them to enter the body when it is warm or leave the body when the

[576] See above pp.60-1.
[577] Hippocrates, *Airs, Waters, Places*, 23, l.19-23 Jones=L2.84.8-12.
[578] Hippocrates, *Airs, Waters, Places*, 5, l.19-21 Jones=L2.24.2-3.
[579] Hippocrates, *Airs, Waters, Places*, 24, l.52-3 Jones=L2.92.2-3.
[580] Hippocrates, *Airs, Waters, Places*, 23, l.30-4 Jones=L.2.84.17-19.

climate is hot.[581] I would suggest that where the climate is extremely changeable this causes physical processes to occur violently and incessantly. These physical changes have an impact on the mental also making the mental changes violent, causing the person to become wild. In a temperate climate, I would suggest that the mind is intelligent at first but then becomes stupid because the climate does not incessantly change but remains the same allowing thought processes to settle and then stagnate because the physical processes within the body do not change to a great extent.

A similar theory can be seen in Aristotle who maintains that a temperate climate generally makes the people more temperate in nature and intelligent.[582] But if a body is too warm then this can have a detrimental effect on the inhabitants where those who are too hot in their innate heat are manic and suffer from hyperactivity disturbing both perception and thought. [583] According to the Ps.-Aristotelian treatise *Problems,* hot black bile causes people to become frenzied when it is near the seat of the intelligence.[584] But those who have bodies that are cold in nature and 'full of cold black bile become dull and stupid.'[585] Too much heat causes thought processes that are too fast and too little heat creates a dull and stupid individual.[586]

For the treatise *Problems,* barbarians are permanently deficient mentally because of their climate because an excess in heat or cold in the environment gives them a 'brutish' character:

[581] See above pp.119-128.
[582] Aristotle, *Problems,* XIV, 1 909a12-17; Ahonen (2014) 91.
[583] Ahonen (2014) 70-73. See Aristotle, *Problems,* XXVII 4, 948a13-30 for the idea that people suffering from mania have particularly hot lungs.
[584] Aristotle, *Problems* 30, 1 954a31-5.
[585] Aristotle, *Problems* XXX, 1 954a30-1.
[586] Cf. *On Regimen* I where it is stated that the cause of manic behaviour is the soul becoming too hot because it is moving too fast so the thought processes are too fast. Hippocrates, *On Regimen* I, 35, l.101-31.

> Why are those who live under conditions of excessive cold or heat brutish in character and aspect? Is the cause the same in both cases? For the best mixture of conditions benefits the mind as well as the body, but excesses of all kinds cause disturbance, and, as they distort the body, so do they pervert the mental temperament.[587] (Aristotle, *Problems,* XIV, 1 909a12-17)

Here, the heat is distorting both the body and the mental temperament.[588] This is not because the body parallels its natural environment like the theories found in the Hippocratic Corpus, instead the body is countering the effects of the natural environment in order to survive.[589] This may indicate a change in theories over time from the body directly paralleling its natural environment to it countering its environment for survival purposes. In terms of the micro-/macrocosm theory, though the body does not parallel the environment in terms of its temperature it parallels it in terms of excess produced where it balances with the natural environment in order to survive.

The effects of an excessively hot or cold climate not only has an impact on the body physically but can also cause mental disturbances. A changeable climate can cause a barbarian-like brutish character whereas a temperate climate can cause a temperate character. However, a temperate climate, could produce men both lazy and thick-witted in the arts because they are not industrious enough. In Aristotle, the body changes to suit its climate in order to survive the excess of heat or the excess of cold and the excess produced in the body as a result causes a disturbance in mental processes. The human body is reacting to its natural environment in its mental

[587] Διὰ τί θηριώδεις τὰ ἔθη καὶ τὰς ὄψεις οἱ ἐν ταῖς ὑπερβολαῖς ὄντες ἢ ψύχους ἢ καύματος; ἢ διὰ τὸ αὐτό; ἡ γὰρ ἀρίστη κρᾶσις καὶ τῇ διανοίᾳ συμφέρει, αἱ δὲ ὑπερβολαὶ ἐξιστᾶσι, καὶ ὥσπερ τὸ σῶμα διαστρέφουσιν, οὕτω καὶ τὴν τῆς διανοίας κρᾶσιν.
[588] Louis notes the similarities between this passage and *Airs, Waters, Places* 12,13,23, and 24: (1993) 241 n.1.
[589] Aristotle, *Problems,* XIV, 8 909b9-24; Ahonen (2014) 91.

functions through the physical effects that the climate is taking on the body. Where the physical human body is a microcosm of the universe as macrocosm, the mental state is also a part of the microcosm because the physical impact of the macrocosm extends to the mental state.

Conclusions

The nature of the climate dictated the nature of the land and the nature of diseases and ailments suffered by the land's inhabitants. An excess or deficiency of heat brought on by the heavenly sphere had profound effects on both the land and the human body. Excessive heat from the sun such as that experienced in southerly countries or in the summer, drew moisture from the natural environment and from the human body resulting in a parching effect on both. This excessive dryness caused diseases associated with dryness such as eye diseases and fevers. However, a deficiency in heat allowed moisture and cold to take hold in both the natural environment and the human body. This caused an excess of moisture in the land where mists and fogs prevailed and in the human body where the inhabitants were pale and sickly and inclined towards phlegmatic temperaments.

The sun could also create a climate characterised by temperance particularly in the spring time. During this time, blood was particularly predominant since it was thought to be a temperate humour and spring was a good time for growth and generation because warmth and moisture was balanced. The same can be said for the full moon, which brought on similar effects where child birth and conception were concerned.

In comparison to the spring, the moon could also bring on fluctuation in temperature just as the spring sometimes could be a season characterised by fluctuation. This could cause illnesses such as the sacred disease in children and people with moist constitutions. Indeed, a fluctuating climate could also have certain effects on the character of the inhabitants living in such a climate making them more war-like and enduring in nature. Moreover, it is an excess of heat or cold that produces detrimental effects on the mental state. Different people living in different places were either sedate and thick-witted or wild and hostile according to *Airs, Waters, Places* depending on the nature of their climate. Barbarians are permanently mentally deficient according to *Problems* because they must counter excesses in their natural environment by producing excess in themselves of hot or cold in order to survive.

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This chapter has explored the effects of different natural phenomena on the human body highlighting how the body parallels the natural environment. The nature of its waters, prevailing wind, and its climate extended to the nature of the human body and the diseases it suffered. Powers could pass in and out of the body through the skin as well as through the nose and mouth when breathing or drinking and whether powers such as moisture or heat were brought to the body or drawn from the body disturbed and changed both physical and mental processes.

The phenomena studied often have a heating or cooling effect with attendant moistening and drying effects. This chapter has shown how hot and cold have two effects on the body where both can moisten and dry. This depends on where the heat or cold is located in relation to the body. Heat always drew moisture to itself

according to the texts examined. If the body or part of the body was heated then it drew moisture to itself and became moist. If the heat lay outside the body such as in the water during bathing or in a particularly hot climate, then moisture was drawn from the body and it was dried through sweating. The cold, on the other hand, worked in the opposite way. When the human body itself was cold or cooled, the body was contracted and a drying effect was produced such as that produced on the skin when cold water was applied or when a cold wind blew contacting and separating out fluids. When the cold lay outside the human body such as when the body was submerged in cold water or the climate was cold, a moistening effect ensued stopping the body from sweating and allowing it to retain its moisture. A balance in hot and cold could also prevail in the natural environment causing a temperance in the body of both physiology and character causing fertility, health and good growth in both body and mind. Owing to the fact that the relationship between powers such as heat, moisture, and air is the same in the natural environment as it is in the human body, the human body parallels its natural environment in a micro-/macrocosm model.

This chapter has also outlined areas of thought inherent in mythological ideas and in religious cult practice that highlight how the micro-/macrocosm was also articulated through myth and popular beliefs. The ideas about the divine powers of nature deities and their effects on the human body show how different systems of thought offer different explanations for how the natural environment effects the human body and ultimately come to the same conclusions as those ideas found in medicine and philosophy. These ideas often also work within a micro-/macrocosm model where the same effects on the environment can be been in the human body. From this, it can be argued that the micro-/macrocosm model is a deep-seated idea

found in different systems of thought and that medicine and philosophy cannot be viewed in isolation from the ideas inherent in myth and popular beliefs.

As the environment changed, the human body changed with it because it existed as part of a micro-/macrocosm model. Since the body paralleled the natural environment and all of its changes the nature of the environment extended to the nature of the diseases suffered by the body. This meant that the natural environment dictated the diseases suffered by the body in any given place and disease patterns could be predicted if the natural environment was observed properly.

Chapter 3

Introduction

We saw in the previous chapter how the human body not only reflected the universe as a whole but it also reflected its immediate natural environment where the climate shaped both land and inhabitants. This chapter will further explore how the nature of the seasons determined the nature of both a place and its people creating a micro-/macrocosm relationship between human body and the immediate environment. It will mainly focus on the Hippocratic treatises particularly *Airs, Waters, Places* because this treatise offers descriptions of a wide range of different places, their climates and their inhabitants.

It was recognised that not all places experienced the seasons in the same way and that different places had different effects on the human body because they had different weather patterns to other places. Indeed, the word for season, ὥρα, in the plural can effectively mean the climate of a place as determined by its seasons.[590] In the first part of this chapter the different places and their inhabitants described by *Airs, Waters, Places* will be compared to ideas found in popular beliefs highlighting similarities in ideas about different peoples living in different climes in different systems of thought. The second part will briefly consider whether a change of place made any difference to the nature of the human body through an examination of what effects the natural environment took on the seed examining *Airs, Waters, Places* in relation to other texts that consider this such as *On the Sacred Disease.*

Part 3 will investigate how Hippocratic physicians noted the changes in weather patterns over the course of a year for a given place as well as any seasonal variation that might occur in order to predict what diseases were likely to occur when. The main texts used will be *Airs, Waters, Places* and the *katastaseis* of the *Epidemics* because they explicitly link weather patterns and disease patterns in an attempt to offer predictive methods for disease based on the weather.[591] Weather patterns and seasona-l variation were phenomena physicians attempted to predict since the nature of the weather directly affected the nature of disease. Owing to the fact that the climate dictated the diseases experienced by the people in a given place, unseasonable weather could cause irregular disease patterns amongst the inhabitants.

1. Different people in different landscapes in *Airs, Waters, Places*

[590] LSJ s.v. ὥρα; Hdt.1.142; Hdt. 2.26.
[591] These treatises are roughly contemporary. See Craik for a discussion (2015) 11 and 90-1.

The treatise that most comprehensively outlines what effects different places have on their inhabitants is *Airs, Waters, Places.* For this treatise, the seasons 'are the most important factors that create differences in men's natures...' (Hippocrates, *Airs, Waters, Places*, 24, 2.248.6-7 Jouanna= L2.90.10) Whether the seasons are all similar or whether they exhibit sharp changes is reflected in the nature of the human body. This can be seen in the comparison of continents such as Asia and Europe and in different landscapes such as mountains and plains.

In *Airs, Waters, Places,* the climate and seasons have an integral connection to the land. The inhabitants are shaped by the climate and reflect the nature of the land because change in the seasons has the same effect on the body as it does on the land. Owing to this, the one reflects the other and reacts to a change in climate in the same way. The inhabitants of a place with seasons that are highly contrasting in nature are all different in appearance to one another whereas a place that has similar seasons produces inhabitants that all resemble one another.[592]

According to this treatise, Europe and Asia are vastly different in terms of their landscapes and, therefore, their inhabitants are very different in their physique and their characters. Europe is described as a more varied land in terms of its geography whereas Asia is a flatter landscape where everything grows well. This is because Asia lies towards the east where the climate is mild and the seasons are uniform in nature. This makes both the land and its inhabitants uniform in appearance. These people are weak and do not have as much courage, endurance or industry as people inhabiting Europe. Those in Europe are subjected to the contrasting nature of the seasons and live in a more rugged landscape. They are

[592] Hippocrates, *Airs, Waters, Places*, 19, l.26-29 Jones=L2.72.69 and 23, l.2-9 Jones=L2.82.6-84.1.

described as a less homogenous race and more warlike than people in Asia for this reason.[593]

This idea is not only applied to different continents such as Europe and Asia but also to different environments such as mountain and plain in this treatise. The difference between people who live on mountains such as herdsmen and those who live on the plain such as farmers and city dwellers is defined by a mix of both popular belief and logical theory. But what is striking is how much emphasis is placed on the effects of the natural environment they live in culminating in complex ideas about how the body reflects its landscape. It is useful to compare the inhabitants of a mountain or mountainous land to that of a plain because it highlights the stark difference between inhabitants brought on by the natural environment in which they live.

The inhabitants of mountains and plains

The inhabitants of the mountain and the plain in *Airs, Waters, Places* can be compared in their nature and physique to the nature of their respective natural environments. This will be examined here against the background of popular beliefs highlighting how the human body reflected its natural environment in two different systems of thought. It will go on to examine the Scythians who lived on a land that was on the boundary between mountain and plain and so produced inhabitants that were a mix of characteristics native to both mountain and plain.

It is important to note that it is not just height or prominence of a mountain that is important for this discussion but the nature of the mountain. First, we must

[593] Hippocrates, *Airs, Waters, Places*, 12-13 Jones=L2.52.10-58.10.

outline what we mean by τό ὄρος. Indeed, to the modern viewer who defines a mountain by height, an ancient mountain could be a small hill. As Langdon discusses in her paper, the prominent nature of this type of feature seems to have been the most important thing for the ancient people when naming something τό ὄρος.[594] Buxton, in attempting to overcome the difficulty of the lack of a fixed definition of a mountain in ancient thought, defines a mountain by comparing it to what it is not a mountain such as a plain or an acropolis, which seems to be a good way forward. [595]

For our purposes, it is also the nature of the land that is important and the term τό ὄρος can mean rough or rugged land or desert.[596] In *Airs, Waters, Places,* the mountain is not only described as 'high' but is characterised as 'rugged' and 'watered.'[597] It is the overall nature of the land has an impact on its inhabitants in terms of both their physical characteristics and their temperament. This treatise describes the nature of the inhabitants of mountainous areas in the following way:

> Inhabitants of a region which is mountainous, rugged, high, and watered where the changes of the seasons exhibit sharp contrasts, are likely to be of big physique, with a nature well adapted for endurance and courage, and such possess not a little wildness and ferocity.[598] (Hippocrates, *Airs, Waters, Places,* 24, 2.244.11-245.5 Jouanna =L2.86.10-14)

Here, the inhabitants are described as a people who are particularly wild and ferocious evoking the image of wild men roaming the heights.

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[594] Langdon (2000) 462.
[595] Buxton (1992) 1-2; Langdon (2000) 462.
[596] LSJ s.v. τό ὄρος.
[597] Hippocrates, *Airs, Waters, Places,* 24, l.7-8 Jones=L.2.86.10-11.
[598] Ὁκόσοι μὲν χώρην ὀρεινήν τε οἰκέουσι καὶ τρηχείην καὶ ὑψηλὴν καὶ ἔνυδρον, καὶ αἱ μεταβολαὶ αὐτέοισι γίγνονται τῶν ὡρέων μέγα διάφοροι, ἐνταῦθα εἰκὸς εἴδεα μεγάλα εἶναι, καὶ πρὸς τὸ ταλαίπωρον καὶ τὸ ἀνδρεῖον εὖ πεφυκότα· καὶ τό τε ἄγριον καὶ τὸ θηριῶδες αἱ τοιαῦται φύσιες οὐχ ἥκιστα ἔχουσιν.

The mountain is a space that is outside the πόλις territory since it is a space neither inhabited nor cultivated.[599] Further, it is important to understand that a mountain stands outside the city and the civilised, cultivated space. With this in mind, a mountain is significantly different to an acropolis, which is found firmly within the city. [600] This is demonstrated in the material evidence where the shrines built to the gods on an acropolis were associated with the city whereas those on the mountain were not generally associated with a particular city.[601]

Anyone who frequented the mountain or inhabited the mountain was an outsider in relation to the πόλις.[602] For example, isolated people such as transhumant herdsmen lived on the mountain with their cattle throughout the summer months, only in the winter did they return to the flatter pastures and the city.[603] According to early Greek writers, the herdsman is like the barbarian in comparison to the civilised agriculturist since he is part mountain-dweller making him less civilised and wild since he is not fully associated with the city.[604]

There is the sense that pastoral activities were considered more ancient than agriculture. Agriculture was considered a development from pastoral farming associating it with civilisation.[605] According to Plato, mankind lived a nomadic and

[599] Buxton (1992) 2.
[600] Buxton (1994) 82.
[601] For a discussion of this see Langdon (2000) 462, 468-9. Langdon cites religious processions that ascend the mountain to give thanks for rain at shrines that are in use by the region rather than the city.
[602] Buxton (1992) 8; see below n.607 on vagabonds.
[603] Buxton (1994) 82-3; Skydsgaard (1988) 75; Sophocles, *Oedipus The King*, 1118-28.
[604] Horden and Purcell (2000) 83;This is made particularly apparent in a scene from the *Bacchae* where the shepherds and herdsmen are discussing amongst themselves and the one who speaks well is described as a 'wanderer about the city and practiced in speaking,' suggesting that herdsmen live partly in the city and partly in the mountains.
[605] Horden and Purcell (2000) 83; Sallares (1991) 36; Isocrates, *Panegyricus*, 28-9; Dicaearchus: Fortenbaugh and Schutrumpf Fr. 55.

scattered existence before cities were built.[606] In the material evidence, sixth century shrines in the mountains to Zeus Meilichios were found on the mountains and Cook notes that this deity was associated with and sympathetic with the outcast and the vagabond.[607] This idea that uncivilised, nomadic people inhabited the mountains is reflected in later sources that personify the mountain. For example, a third century BC personification of Mount Helikon depicts him as a wild-looking man with unkempt hair and beard.[608]

Mountain peoples are also described as ferocious in *Airs, Waters, Places* and mountains are often associated with violent events.[609] For example, in the *Bacchae* the mountain is used as the space where the Maenads and Bacchants run wild and commit violent acts with inhuman strength and ferocity.[610] Here, women running wild on the mountain is associated with madness.[611] Indeed, because the women have been possessed by Dionysus and are now like wild Bacchants, the women are removed from the civilised πόλις to the mountain suggesting that the mountain is the more appropriate space for them.[612] In ancient cult, Bacchic rites took place outside the πόλις when women took to the mountain to become wild in honour of Dionysus.[613] By ascending the mountain, a different behaviour was assumed as well as a different appearance since it was a space where civilised humanity became wild. The idea that mountain people were more wild than those who lived elsewhere in

[606] Plato, *Protagoras,* 322a-d; Guthrie (1971) 66; Further, the idea that mountains were the first habitats of people before they became civilised and formed cities is significant here Buxton (1992) 8. Plato, *Laws,* 677b-c.
[607] For evidence of Zeus Meilichios on the mountain see Langdon (1976) 80 and to see evidence for Zeus Meilichios connected to the Vagabond see Cook (1925) vol. 2. 1093-1104.
[608] Langdon (2000) 464; LIMC s.v. Helikon.
[609]Buxton (1992) 7.
[610] Euripides, *Bacchae,* 734-45; For further examples of wild men or violence on the mountain see Buxton (1994) 88-90.
[611] Buxton (1994) 92.
[612] Euripides, *Bacchae,* 31-9.
[613] Paus. 10.4.3; Buxton (1994) 94-5; Burkert (1985) 290.

Airs, Waters, Places can be paralleled to these ideas found in cult and tragedy but instead of a divine possession brought on by Dionysus, the seasons and their many changes are blamed for the mental shocks brought to a person.[614] Here, two systems of thought hold the same ideas about the effects of the mountain on the human suggesting that ideas about mountain people were deep-seated.

Despite the idea that the mountain was a somewhat dangerous place where the natural order was inverted and the people dwelling there were wild and ferocious, this did not prevent people from ascending the mountain, working on it and taking advantage of the natural environment and resources that the mountain provided.[615] For example, men went there to hunt, mine, and cut down trees as well as look after flocks as herdsmen.[616] The work on the mountain was hard and carried out in a harsh environment. With this is mind, it is not surprising that the inhabitants on the mountain were thought to be well-adapted to physical endurance and have 'big forms' (εἴδεα μεγάλα) in *Airs, Waters, Places*.[617] Here, though the reason is put down to the changeable nature of the seasons and harsh environment in this region, a continuation of ideas already apparent in Greek thought can be traced that see mountain dwellers or people who frequent the mountain as large people.

The fact that the author of *Airs, Waters, Places* describes the seasons of a land which is mountainous as changeable and affecting those living there is significant since the Hippocratic physician is attempting to attribute the nature of mountain people to the changes of the weather rather than the work associated with mountain living thus positing a logical explanation associated directly with the

[614] See above for effects of temperature and changes in temperature on the mind: pp.179-83.
[615] Horden and Purcell (2000) 80-1.
[616] Buxton (1994) 83; Thommen (2012) 37-8 and 62-3; timber: Thucydides, 2.75; hunting: Xenophon, *On Hunting*, 9.11, 9.17; Skydsgaard (1988) 77-81; Horden and Purcell (2000) 80-6. Mining: Hdt. 6.46-7.
[617] Hippocrates, *Airs, Waters, Places*, 24, l.7-12 Jones = L2.86.10-14.

macrocosm. The sudden changes in the weather produce such a wild and enduring nature because of the sudden mental shocks and also produce men of a 'big forms' that reflects their natural, rugged environment. Indeed, ἐνταῦθα refers to both mountain and seasons in this sentence suggesting that the inhabitants are reflecting both the nature of the seasons and the nature of the land.[618]

It should also be noted that being large is the only characteristic that they are said to all have in common, suggesting that they do not all look the same in any other way. People who inhabit the mountain reflect their immediate natural environment because the variation in the weather causes both a rugged landscape and varied people in terms of appearance who are wild and enduring in their nature.

Where mountains were wild, uncultivated territory, plains and the flatter uplands were the places where cities could be built and where civilisations flourished.[619] In *Airs, Waters, Places* plains are described as 'level' (λείην) and 'watered.' (ἔνυδρον) and the inhabitants are tall but unmanly and tame:

> Such as dwell in a high land that is level, windy, and watered, will be tall in physique and similar to one another, but rather unmanly and tame in character. [620] (Hippocrates, *Airs, Waters, Places*, 24, 2.247.1-4 Jouanna =L2.90.1-3)

[618] Hippocrates, *Airs, Waters, Places*, 24, l.7-12 Jones= L2.86.10-14. Ὁκόσοι μὲν χώρην ὀρεινήν τε οἰκέουσι καὶ τρηχείην καὶ ὑψηλὴν καὶ ἔνυδρον, καὶ αἱ μεταβολαὶ αὐτέοισι γίγνονται τῶν ὡρέων μέγα διάφοροι, ἐνταῦθα εἰκὸς εἴδεα μεγάλα εἶναι.

[619] For the connection between civilisation and the plain in the Hippocratic Corpus see *Ancient Medicine* where it is argued that man could not live properly until he cooked food and maintained a good diet. The food he speaks of is wheat and food from cultivated crops such as bread and barley cake. This is in opposition to 'crude foods' from the natural environment that have not been cooked or compounded by the skills of man. These crude foods were eaten by primitive humanity before these skills had been discovered causing them to die in great numbers. Hippocrates, *On Ancient Medicine*, 3, l.21-26 Jones=L1.576.9-13; Guthrie (1971) 62.

[620]Ὁκόσοι δὲ ὑψηλὴν οἰκέουσι χώρην καὶ λείην καὶ ἀνεμώδεα καὶ ἔνυδρον, εἶεν ἂν εἴδεα μεγάλοι καὶ ἑωυτέοισι παραπλήσιοι· ἀνανδρότεραι δὲ καὶ ἡμερώτεραι τουτέων αἱ γνῶμαι.

Here, to match the land, the inhabitants are similar to one another and tame in nature unlike the mountain dwellers.

Like the description of the plain's inhabitants, the inhabitants of parts of Asia are very tall in stature and 'of a fine physique.' The author states that this is because everything grows 'to far greater beauty and size' in Asia due to the nature of the land and the uniformity of the seasons. The growth of the inhabitants can be compared to the growth of the crops, which grow well in this earth. Indeed, the land of the region in Asia is situated 'midway between the heat and cold' is described as very fruitful, mild and wooded because of the temperate climate and there is great emphasis put on the plentiful harvest:[621]

> Here the harvests are likely to be plentiful, both those from seed and those which the earth bestows of her own accord, the fruit of which men use, turning wild to cultivated and transplanting them to a suitable soil.[622]
>
> (Hippocrates, *Airs, Waters, Places,* 12, 2.221.4-8= l2.54.10-13)

Shines found on the plain are often dedicated to Demeter who is prayed to for good harvests.[623] Demeter's sanctuary at Eleusis was known for its fertile land, particularly the Thrasian plain, which was well drained and predominantly associated with its agricultural fertility.[624] The fertility and civilisation of this type of land can be seen in the religious cult performed on it. Similar ideas about the nature

[621] Hippocrates, *Airs, Waters, Places,* 12, ln.20-38 Jones=L2.54.4-16.
[622] τά τε ὡραῖα αὐτόθι πολλὰ ἐοικὸς γίγνεσθαι, ὁκόσα τε ἀπὸ σπερμάτων, καὶ ὁκόσα αὐτὴ ἡ γῆ ἀναδιδοῖ φυτά· ὧν τοῖσι καρποῖσι χρέονται ἄνθρωποι, ἡμεροῦντες ἐξ ἀγρίων, καὶ ἐς ἐπιτήδειον μεταφυτέοντες.
[623] Demeter was the goddess predominantly connected with a fertile land and in the most famous myth associated with this goddess she lets the earth lie barren for a year and threatens the race of men when Hades snatches Persephone (*Homeric Hymn to Demeter*, 305-14.) See Parker for the idea that Demeter was not necessarily connected to the earth but with agriculture as an activity (2011) 81.
[624] For Eleusis and the Thrasian plain see: see Goette (2001) 280. This land was well-drained and easily cultivated and closely tied to bread as a staple food-stuff: see Horden and Purcell (2000) 426.

of plains can be found in ancient medicine and ancient cult practice suggesting a popular line of thought.

Further, in opposition to the mountain dwellers, the inhabitants are described as tame and unmanly as well as lacking in courage and endurance meaning they are easily ruled by despots according to this author.[625] The reason for this is put down to the temperate climate and the unchanging seasons that do not bombard the body with mental and physical shocks unlike those inhabiting the mountain. The plain is a land that has temperate seasons and can be easily tamed into good farmland that produces good harvests where crops grow well. In parallel, the human body also grows well here and has a mild temperament that is easily ruled to match the land and the seasons. The polarity existing between the mountain and the plain can be seen in the differences in land, people, civilisation, and religious cult. The mountain is a rugged, bare place often rendered uninhabitable by the weather conditions and the plain is a mild, tame place easily cultivated and inhabited. However, the plain and the mountain are not always entirely disconnected and there is a hinterland between mountain and plain where one transforms into the other. The inhabitants of this hinterland are an odd mix of features and nature since they reflect a changing landscape that is neither mountain nor plain. This can be seen in *Airs, Waters, Places* when the author describes the Scythian race, their land and their customs.

The Scythian plain

The tribe of the Scythians inhabits the plains very close to the Rhipaean mountains according to *Airs, Waters, Places*. Here it seems that the mountain and plain are strangely similar in that they both have harsh environments. The plain on which the

[625] Hippocrates, *Airs, Waters, Places,* 12, l.35-44, 16, l.3-28, and 23, l.30-41 Jones=L.2.54.15-56.3,62.13-64.14,84.17-86.5.

Scythians live is said to 'slope from the north' suggesting that the plains are like the lowland areas of the mountains. The land is described as a 'level grassland, high, and fairly well-watered' (…πεδιάς ἐστι καὶ λειμακώδης καὶ ὑψηλὴ[626], καὶ ἔνυδρος μετρίως·) since there are large rivers that drain the water from the plains on which they live.[627] The plains are high and bare and are situated to the north subjected to north winds and very little warmth from the sun. Here, the mountains situated to the north are significant as they are home to 'snow, ice, and heavy rain' which is said to never leave the mountains making them uninhabitable.[628] In addition, the mountains do not offer any shelter as they do not encircle the plain. Thus, the plains are not subject to the changeable weather of the mountains, which are home to all the precipitation, nor are they sheltered by them. Instead, the wind is 'chilled' by the precipitation and the land is enveloped in a thick fog 'so that winter is perennial, while summer, which is but feeble, lasts only a few days.'[629] The environment does not change a great deal and the seasons are uniform resembling winter all year round and providing a harsh environment in which to live.[630] This environment resembles the harsh environment experienced on the mountains but the weather does not change sharply and so also resembles the climate found on the plains.

As a result of this environment, the Scythians behave like mountain dwellers in that they are nomadic and can be quite combative. However, they still have

[626] The loeb edition has this word as ψιλή meaning bare but most MSS have it ὑψηλὴ, see Loeb edition Vol. 1.2 p.118 n.2.
[627] Hippocrates, *Airs, Waters, Places,* 18, l.5-8 Jones=L2.68.6-7. Thomas has discussed the tribe of the Scythians as described by Herodotus who goes into detail about the different tribes and customs. Though the connection between natural environment and ethnicity is made, the effects on the physical nature of the Scythians is not examined to any length focusing more on the customs. (2000) 54-74.
[628] Hippocrates, *Airs, Waters, Places,* 18-19 Jones=L2.68.3-72.21. Herodotus also notes that there is much snow to the north of the Scythians and that the Scythians describe snow as 'feathers,' which cannot be travelled through. Hdt.4.31.
[629] Hippocrates, *Airs, Waters, Places,* 19, l.13-20 Jones=L270.10-72.2.
[630] It is interesting that Herodotus tells the story of Herakles falling asleep in Scythia when he encountered wintry and frosty weather in Hdt. 4.8.3.

characteristics associated with plain dwelling such as the idea that they all look the same.[631] The fact that they are described as a nomadic race relates more to the mountain people described above who do not cultivate the land but move around with their flocks. The harsh environment similar to that found on the mountains may be a reason why the Scythians are nomadic and combative in nature in this treatise.[632] Indeed, these plains hardly resemble the fertile land we find in Asia and the Scythians do not have the tame nature of Asians. However, despite the harsh environment, the Scythian plains are still considered a landscape characterised by a uniform environment with uniform seasons and the Scythians are described as a homogenous people. For example, the author states that the people all resemble one another in appearance because the seasons are all similar to one another:

> ...but because of their fat and the smoothness of their flesh their physiques are similar, men's to men's and women's to women's. For as the seasons are all alike there takes place no corruption or deterioration in the coagulation of the seed, except through the blow of some violent cause or of some disease.[633] (Hippocrates, *Airs, Waters, Places,* 19, l.40-6)

Here, it is the similarity of the seasons and their effects on the seed that produce the uniformity in appearance that characterises the Scythian race.

In addition, this author notes that due to their naturally fat and smooth bodies, the Scythians cauterise themselves before they go into battle to take away some of the moisture from their bodies and make them stronger. This suggests that they are

[631] It must be noted that these people are described in *Airs, Waters, Places* because they are *different* from most other races in both their customs and their appearance.
[632] Sassi (2001) 109.
[633] ἀλλὰ διὰ πιμελήν τε καὶ ψιλὴν τὴν σάρκα, τά τε εἴδεα ἔοικεν ἀλλήλοισι, τά τε ἄρσενα τοῖσιν ἄρσεσι, καὶ τὰ θήλεα τοῖσι θήλεσιν. Τῶν γὰρ ὡρέων παραπλησίων ἐουσέων, φθοραὶ οὐκ ἐγγίγνονται οὐδὲ κακώσιες ἐν τῇ τοῦ γόνου ξυμπήξει, ἢν μή τινος ἀνάγκης βιαίου τύχῃ ἢ νούσου.

not naturally made for combat due to the uniformity of the seasons, but paradoxically, they are combative in nature because of their harsh environment.

There are also different tribes of Scythians listed in this treatise. The Sauromatae tribe settled around the lake Maeotis had different customs to the nomadic Scythians who lived in wagons moving about the land with their animals.[634] The fact that there is this mix of culture and activity on these plains shows that landscapes could overlap, and, as a result, the nature of its inhabitants could be varied or ambiguous. Even in the highly schematic thought of the ancient Greeks regarding types of people and types of land, boundaries could be blurred.

The Scythians are a prime example of a race half nomadic and half settled living on the border between mountain and plain where the two landscapes merge into one another. They reflect their landscape where the environment is harsh and they are wild and combative exhibiting much endurance for the weather but they all resemble one another reflecting the plain's uniform climate.

2. A change in place

The effects of a change in place is not mentioned to a great extent in the Hippocratic Corpus suggesting that a change in place would not fundamentally change the physical or mental nature of a human. The place where you are born or conceived is what defines you since the natural environment has an impact on the human from the seed. Indeed, the Hippocratic physician does not suggest a change of location for

[634] Herodotus also describes different types of Scythians but goes into much more detail than the author of *Airs, Waters, Places.* He describes a tribe of Scythians who have settled on the land and cultivated it. Herodotus notes that this particular tribe believe themselves to be superior to other Scythians and he agrees that they are the 'best' Scythians. Hdt 4.20.1. This Scythian land is described as 'dug.' Also, part of the plain is said to have a shrine to Demeter on it suggesting cultivated, fertile and civilised land: Hdt. 4.53.6. See above p.196 n.623.

health reasons. A change of water might be beneficial or a change in exercise regime but a complete change of natural environment is not prescribed. [635]

For the Hippocratic physician there was little point in advising change of natural environment since a person was shaped from the nature of the seed. According to *On Generation*, parents passed on their features and constitution as well as their disposition to a child. For example, if a parent is deformed in some way, there is a chance that the seed may also be deformed and produce a deformed child:

> It is also true that when parents are maimed, their children are usually born whole: for what is maimed still has everything equal in number to the whole. But when some disease befalls the moisture from which the sperm is formed, the four kinds of substances that are naturally present in this part do not produce a complete seed, but one weaker to the degree that it is maimed; thus it does not seem any wonder to me that this offspring is maimed like its parent.[636] (Hippocrates, *On Generation,* 11, l.1-8 Potter=L7.484.14-20)[637]

In *On the Sacred Disease* the type of constitution a parent might have such as whether they are phlegmatic or bilious passes onto the children because the seed is drawn from all of the body:

> Its (the sacred disease's) origin, like that of other diseases, lies in heredity. For if a phlegmatic parent has a phlegmatic child... there is nothing to prevent some of the children suffering from this disease when one or the other of the

[635] For the benefits of a change in diet and exercise see *On Regimen* I-IV.
[636] Ὅτι δὲ, πεπηρωμένων ἀνθρώπων, ὑγιέα γίνονται τὰ παιδία, ὡς ἐπὶ τὸ πλεῖστον συμβαίνει· ἔχει γὰρ τὸν ἀριθμὸν πάντα τὸ πεπηρωμένον τῷ ὑγιεῖ· ἐπὴν δέ τί οἱ νόσημα προσπέσῃ καὶ τοῦ ὑγροῦ αὐτοῦ, ἀφ' οὗ τὸ σπέρμα γίνεται, τέσσαρες ἰδέαι ἐοῦσαι, ὁκόσαι ἐν φύσει ὑπῆρξαν, τὴν γονὴν οὐχ ὅλην παρέχουσιν, ἀσθενέστερον δὲ τὸ κατὰ τὸ πεπηρωμένον, οὐ θαῦμα δέ μοι δοκέει εἶναι καὶ πηρωθῆναι, καθάπερ ὁ τοκεύς.
[637] Cf.The longheads in *Airs, Waters, Places*, 14 Jones=L2.58.11-60.9. Cf. also *On the Nature of Man*, 7 for another four humour theory. For further discussion see Lonie (1981) 144-6.

> parents suffered from it; for the seed comes from every part of the body, healthy seed from the healthy parts, diseased seed from the diseased parts.[638] (Hippocrates, *On the Sacred Disease,* 2 [5 Jones] 2.10.11-18 Jouanna =L6.364.15-20)

The seed imitates the parent in every way even down to any maimed parts a parent might have. Thus, if a phlegmatic person has a child then the phlegmatic constitution will be passed on to the child.

The author of *Airs, Waters, Places* takes a different stance to the views listed above.[639] Rather than arguing that the nature of the parent is the deciding factor in how a child is shaped, he argues that the natural environment where a child is conceived is the determining factor in how a child looks and behaves. For this author, the seed is said to be different in each season and it was affected by the nature of the climate. Corruption of the seed takes place when the seasons are very different to one another producing a people who are varied in their appearance. But when the seasons are uniform and there are fewer changes, corruption is less likely to take place creating people who look the same:

> It is natural to realise that generation too varies in the coagulation of the seed, and is not the same for the same seed in summer as in winter nor in rain as in drought. It is for this reason, I think, that the physique of Europeans varies more than that of the Asiatics, and that their stature differs very widely in

[638] Ἄρχεται δὲ ὥσπερ καὶ τἆλλα νουσήματα κατὰ γένος· εἰ γὰρ ἐκ φλεγματώδεος φλεγματώδης, καὶ ἐκ χολώδεος χολώδης γίνεται, καὶ ἐκ φθινώδεος φθινώδης, καὶ ἐκ σπληνώδεος σπληνώδης, τί κωλύει ὅτῳ πατὴρ καὶ μήτηρ εἴχετο, τούτῳ τῷ νοσήματι καὶ τῶν ἐκγόνων ἔχεσθαί τινα; ὡς ὁ γόνος ἔρχεται πάντοθεν τοῦ σώματος, ἀπό τε τῶν ὑγιηρῶν ὑγιηρὸς, ἀπό τε τῶν νοσερῶν νοσερός.

[639] The treatise is roughly contemporary with the other two treatises so it is not a development of ideas rather a different view. Indeed, a similar view is maintained in *Airs, Waters, Places* to the ones put forward in *On Generation* and *On the Sacred Disease* where the longheads are described. See n.640 above and Jouanna's comments: (2003) 67 n.4.

each city. For there appear more corruptions in the coagulation of the seed when the changes of the seasons are frequent than when they are similar or alike.[640] (Hippocrates, *Airs, Waters, Places,* 23, 2.242.5-243.2 Jouanna =L2.84.1-8)

For as the seasons are alike there takes place no corruption or deterioration in the coagulation of the seed, except through the blow of some violent cause or of some disease.[641] (Hippocrates, *Airs, Waters, Places,* 19, 2.235.4-7=L2.72.18-21)

For this author, the natural environment plays a significant part in shaping the human since the seasons have a direct effect on the nature of the seed itself. If a climate is uniform then the seed suffers no change and produces a child that resembles the parents and the other inhabitants of the place. If the climate is particularly changeable from season to season, then the seed will suffer change and the child will be more likely to be born with a different physique to the other inhabitants. This may be one reason why a change in location is not advised to aid certain ailments because once a person has been shaped by his environment at the level of the seed, even if the child moved to a different place, the effect of the previous location would still be inherent in the child.

This is also true of the character of a person in *Airs, Waters, Places.* Men raised in Asia are generally cowardly and are subject to kings because they have been born in a mild natural environment that can be easily tamed and the inhabitants

[640] Ἀπὸ τουτέων εἰκὸς αἰσθάνεσθαι καὶ τὴν γένεσιν ἐν τῇ ξυμπήξει τοῦ γόνου ἄλλην καὶ μὴ τῷ αὐτέῳ τὴν αὐτέην γίγνεσθαι, ἔν τε τῷ θέρει καὶ τῷ χειμῶνι, μηδὲ ἐν ἐπομβρίῃ καὶ αὐχμῷ· διότι τὰ εἴδεα διηλλάχθαι νομίζω τῶν Εὐρωπαίων μᾶλλον ἢ τῶν Ἀσιηνῶν· καὶ τὰ μεγέθεα διαφορώτατα αὐτὰ ἑωυτοῖσιν εἶναι κατὰ πόλιν ἑκάστην· αἱ γὰρ φθοραὶ πλείονες ἐγγίγνονται τοῦ γόνου ἐν τῇ ξυμπήξει ἐν τῇσι μεταλλαγῇσι τῶν ὡρέων πυκνῇσιν ἐούσῃσιν ἢ ἐν τῇσι παραπλησίῃσι καὶ ὁμοίῃσιν.

[641] Τῶν γὰρ ὡρέων παραπλησίων ἐουσέων, φθοραὶ οὐκ ἐγγίγνονται οὐδὲ κακώσιες ἐν τῇ τοῦ γόνου ξυμπήξει, ἢν μή τινος ἀνάγκης βιαίου τύχῃ ἢ νούσου.

parallel this land in their character. Men of Greece are generally brave and spirited because of their harsh land and they reflect their natural environment in their enduring nature. But a change in character such as bravery from cowardice can be brought on artificially by institution and the imposition of law according to this treatise.[642] Thus, it is not the change in environment that brings on a change of character but a change in law and institution.

When Cyrus states that moving his men to a different land would 'breed' soft men at the end of Herodotus' *Histories*, this suggests that the next generation of men will be affected by a change in climate rather than his own men.[643] His men would not be affected by the change in climate but the next generation would be born in a land that shapes them into softer, less-warlike men. The fact that the parents of this generation are war-like and men suited to endurance does not affect the nature of the child, it is the natural environment that takes an effect on the child.

In both *Airs, Waters, Places* and Herodotus, the change in natural environment does not fundamentally change the human body since it has already been shaped at the level of the seed by the natural environment in which it was conceived. A child born in a different land to that of its parents is shaped by the environment in which it was conceived and this affects the child in both its character and its physical nature. In comparing these works and seeing similar theories offered, one might suggest the existence of an alternative line of thought where the natural environment dictates the nature of the seed rather than the human shaping the seed that it produces.

[642]Hippocrates, *Airs, Waters, Places,* 24, l. 19-22 and 16, l.14-39 Jones=L2.88.4-6, 64.5-22.
[643] Hdt. 9.122.

When describing certain people and their disease patterns, the Hippocratic physician confined his description to the natural habitat of those people and did not describe how these people coped with a change in natural environment. For the Hippocratic physician, a certain place had a specific climate and that climate had the same effect on both the natural environment and the human body shaping both so that they reflected one another. This also applied to the disease patterns suffered by the population of a certain place. As the weather changed over the seasons so the body changed bringing on different diseases that reflected the nature of the season.

3. Disease patterns and seasonal variation in *Airs, Waters, Places*

As well as shaping mankind physically and mentally, different weather patterns also shaped the inhabitants of a certain place and dictated their normal disease patterns and constitutions. Owing to this, it is important for the physician to establish what the general weather pattern was in a given place and the general disease pattern that occurred as the seasons changed because the diseases were a direct result of the weather. The author of *Airs, Waters, Places* schematises both the weather and the afflictions suffered by the inhabitants of each place he describes. For him, the seasons produce change in the body and the nature of the seasons dictates both the nature of the inhabitants and the land in which they live. The nature of the seasons and their attendant weather patterns also dictate the disease patterns in a given place. It should be noted that, despite the fact that in some places the seasons can be similar to one another and produce a temperate climate where everything grows well and the inhabitants are healthy, there is still a disease pattern. Indeed, the author of *Airs, Waters, Places* mentions that the city facing the east has the most temperate climate but still has diseases resembling those in the city exposed to the hot winds described a few chapters before it, though the diseases are not quite as bad as those in the city

exposed to the hot winds.[644] Again, the nature of the seasons determines the disease patterns since a healthy place generally has slight changes of the seasons but an unhealthy place generally has great changes in the seasons, which bring on violent attacks of disease.

The nature of disease patterns vary from place to place. Those who live in a climate that does not vary have a regular disease pattern or set of ailments that does not vary whereas those who live in a land that has seasons that starkly contrast suffer an array of diseases. For example, in the unchanging environment of Scythia, the inhabitants are flabby and moist because of the moisture that predominates in their climate. Their climate is also cold as well as moist and the author describes their climate as generally wintery.[645] In terms of the ailments suffered by these people, owing to the cold and the excess moisture, both men and women are prone to infertility. The women are too moist and fat to conceive which has negative effects on the womb's ability to admit the seed.[646] The men's abdomen is both soft and cold, which negatively affects the veins and therefore the seed, which was thought to descend through the veins, according to this author.[647] Because the weather does not improve for a long period of time in this land, the summer only lasting a few days, the inhabitants are continually subjected to wintery weather, which is excessively cold and moist contributing to their infertility.[648] As we saw above, the climate that promoted fertility was moist and warm resembling spring in nature, the season most suited to conception and childbirth.[649] The Scythians however, do not have spring-like weather as part of their climate and this is part of the reason why they are prone

[644] Hippocrates, *Airs, Waters, Places,* 5, l.23-7 Jones=L2.24.5-8
[645] Hippocrates, *Airs, Waters, Places,* 18, l.1-5 and 19, l.19-20 Jones=L2.68.3-4, 72.1-2
[646] Hippocrates, *Airs, Waters, Places,* 21, l.8-16 Jones=L2.76.2-7.
[647] Hippocrates, *Airs, Waters, Places,* 21, l.1-6 and 22, l.18-27 Jones=L2.74.1-4 and 76.16-78.12 ; The idea that the seed descends from the brain can also be seen in Hippocrates, *On Sevens,* 6:p.41.
[648] Hippocrates, *Airs, Waters, Places,* 19, l.19-20 Jones= L2.68.3-4, 72.1-2.
[649] See above pp.166-173.

to infertility. Indeed, infertility is one of the greatest ailments for the Scythians, which is not only produced by their nomadic life style of riding horses or sitting in wagons but also by the continuous moist and cold climate. This is an ailment that occurs all year round for the Scythian people and there is no season mentioned where conception would be best such as the spring time since their climate does not vary to a great degree.[650]

In opposition to this, people inhabiting a place where the climate is characterised by changeable seasons all different to one another in nature suffer an array of diseases. The best example of this is the description of a city that faces the west put forward by the author of *Airs, Waters, Places.* The author states that the climate of the city is precisely like that of autumn because it suffers so many changes in weather and, as a result, the inhabitants are subject to many diseases.[651]

The fact that the weather patterns and disease patterns are closely linked in this way meant that a place experiencing its normal weather patterns would inevitably experience its normal disease patterns. The body is paralleling the natural environment in such a way that change in weather caused change in disease and stable continuous weather caused stable diseases that continued as long as the weather continued. This close link between weather conditions, bodily condition and disease can be seen in other texts in the Hippocratic Corpus where descriptions of what diseases are brought on by a change in season or weather are offered. The Hippocratic treatises *Airs, Waters, Places* and *Epidemics* in particular recognised

[650] It must be noted that a great deal of the infertility is caused by the life style of this tribe where the men are continually riding around on horses and the women, once they are married, sit in wagons all day becoming excessively fat. Indeed, the slave girls mentioned are more fertile because they run around: Hippocrates, *Airs, Waters, Places,* 21, l.17-20 Jones=L2.76.8-11. However, the climate has a part to play in the infertility of this race since the climate has produced in them a constitution that is moist and cold. Indeed, it is the first cause of infertility to be mentioned before the life style is brought in.

[651] Hippocrates, *Airs, Waters, Places,* 6, l.14-16 and l.22-5 Jones=L2.24.19-20 and 26.5-8.

that because of this link between weather and disease, disease patterns could be predicted through predicting the weather.

4. Predicting the weather and predicting disease

The seasons and the human body

The body as part of a micro-/macrocosm model changes with the change in the seasons since it parallels its environment. The run of the seasons in a given place determined both the nature of the inhabitants and their disease patterns. Certain seasons had certain characteristics and these extended to the character of diseases suffered by the body because the nature of the body paralleled its environment. Owing to this, one set of diseases could arise in one season paralleling the nature of that season but then be terminated in the opposing season because the weather changes and diseases of the opposite nature then arise. As a result, the physicians could predict disease patterns based on a change in weather patterns. This could be achieved through observing the stars that marked the time when the seasons changed and looking for signs that indicated what nature the weather was going to take on.

The author of *Airs, Waters, Places* states that a physician should pay close attention to the effects of the seasons:

> First he ought to consider what effects each season of the year can produce; for the seasons are not all alike, but differ widely both in themselves and at their changes.[652] (Hippocrates, *Airs, Waters, Places,* 1, 2.186.2-5 Jouanna=L2.11.2-4)

[652] πρῶτον μὲν ἐνθυμέεσθαι τὰς ὥρας τοῦ ἔτεος, ὅ τι δύναται ἀπεργάζεσθαι ἑκάστη· οὐ γὰρ ἐοίκασιν οὐδὲν, ἀλλὰ πουλὺ διαφέρουσιν αὐταί τε ἑωυτέων καὶ ἐν τῇσι μεταβολῇσιν.

As we saw above, the spring is generally considered a temperate season, good for childbirth and conception, the summer is hot and dry and brings on fevers, the winter is cold and damp and brings on phlegmatic diseases, and the autumn is a season characterised by change and so brings many diseases that are prone to change at this time.[653] Again, the effects of the seasons on the human body are examined in detail by the author of *On the Nature of Man.* This author discusses how four humours black bile, yellow bile, phlegm, and blood become more or less powerful in the body according to the seasons. This occurs because the nature of the four seasons matches the nature of the four humours. When winter brings on wet and cold weather, the wet and cold humour phlegm becomes predominant and phlegmatic diseases occur in the body. In summer, yellow bile prevails because it is dry and hot like the season. In spring, blood prevails because the season is warm and moist, and in autumn, the season is dry and cold bringing on the predominance of dry and cold black bile in the body.[654]

The changes in weather caused by the seasons brought on maladies associated with the weather phenomena occurring at that particular time of year. For example, as summer turned to autumn, the dry heat was replaced by a cold and dry climate bringing on a change in bile in the body according to *On the Nature of Man*. According to *Aphorisms* III, a change in the nature of fevers occurred at this time and there was an occurrence of different diseases such as melancholy.[655]

Owing to the opposing natures of the seasons, winter and summer, autumn and spring, the diseases that occur in them are also opposing in nature. Thus, the diseases that occur in summer are cured by the onset of winter:

[653] See below p.217.
[654] Hippocrates, *On the Nature of Man,* 7, l.1-48 Jones=L.6.46.9-48.20.
[655] Hippocrates, *Aphorisms* III, 22 Jones=L4.496.4-8.

> And it seems to me natural that the coming on of summer should have been helpful. For the coming on of winter resolves the diseases of summer, and the coming on of summer removes those of winter.[656] (Hippocrates, *Epidemics* III, 3.15, l.5-8 Jones=L3.98.9-100.3)

Thus, the physician could be confident that the course of one set of diseases would end when the opposing season from which they arose manifested itself. This idea is repeated in *On the Nature of Man*:

> ...such diseases as increase in the winter ought to cease in the summer, and such as increase in the summer ought to cease in the winter...When diseases arise in spring, expect their departure in autumn. Such diseases as arise in autumn must have their departure in spring. Whenever a disease passes these limits, you may know that it will last a year.[657] (Hippocrates, *On the Nature of Man*, 8, 186.13-20 Jouanna =L6.50.14-52.1)

The change from one season to another is a particularly dangerous time for disease since this is when they change their nature. For example, the author of *Airs, Waters, Places* states that a physician should be wary of the solstices and the equinoxes:

> The following are the four most violent changes and the most dangerous: both solstices, especially the summer solstice, both the equinoxes, so reckoned, especially the autumnal...One must also guard against the risings of the stars, especially of the Dog Star, then of Arcturus, and also of the setting

[656] Δοκέει δέ μοι προσωφελῆσαι κατὰ λόγον τὸ γενόμενον θέρος· τὰς γὰρ θερινὰς νούσους χειμὼν ἐπιγενόμενος λύει, καὶ τὰς χειμερινὰς θέρος ἐπιγενόμενον μεθίστησιν.

[657] ὁκόσα μὲν τῶν νουσημάτων χειμῶνος αὔξεται, θέρεος λήγειν, ὁκόσα δὲ θέρεος αὔξεται, χειμῶνος λήγειν…Ὁκόσα δὲ ἦρος γίνεται νουσήματα, προσδέχεσθαι χρὴ φθινοπώρου τὴν ἀπάλλαξιν ἔσεσθαι αὐτέων· ὁκόσα δὲ φθινοπωρινὰ νουσήματα, τουτέων τοῦ ἦρος ἀνάγκη τὴν ἀπάλλαξιν γενέσθαι· ὅ τι δ’ ἂν τὰς ὥρας ταύτας ὑπερβάλλῃ νούσημα, εἰδέναι χρὴ ὡς ἐνιαύσιον αὐτὸ ἐσόμενον.

> of the Pleiades. For it is especially at these times that diseases come to a crisis. Some prove fatal, some come to an end, all others change to another form and another constitution.[658] (Hippocrates, *Airs, Waters, Places*, 11, 2.218.13-219.8 Jouanna=L2.52.1-8)

Here, we see that change in the weather is particularly dangerous since it produces a change in the disease pattern. Autumn is the most dangerous equinox because the changes taking place in autumn were considered to be particularly violent. In *Aphorisms* too, the author states that the change in the seasons causes diseases:

> It is chiefly the changes of the seasons which produce diseases, and in the seasons the great changes from cold to heat, and so on according to the same rule.[659] (Hippocrates, *Aphorisms* III, 1 Jones=L4.486.3)

He goes on to list the types of diseases that occur in each season.[660]

Moreover, *Airs, Waters, Places* and *Aphorisms* warn against bringing change to the body at the time of changes in weather:

> One should be especially on one's guard against the most violent changes of the seasons, and unless compelled one should neither purge, nor cauterize or cut the bowels, before at least ten days are past.[661] (Hippocrates, *Airs, Waters, Places*, 11, 2.218.10-13 Jouanna =L2.50.2-52.1)

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[658] μέγισται δέ εἰσιν αἵδε καὶ ἐπικινδυνόταται, ἡλίου τροπαὶ ἀμφότεραι καὶ μᾶλλον αἱ θεριναί· καὶ ἰσημερίαι νομιζόμεναι εἶναι ἀμφότεραι, μᾶλλον δὲ αἱ μετοπωριναί. Δεῖ δὲ καὶ τῶν ἄστρων τὰς ἐπιτολὰς φυλάσσεσθαι, καὶ μάλιστα τοῦ κυνὸς, ἔπειτα ἀρκτούρου, καὶ ἔτι πληϊάδων δύσιν· τά τε γὰρ νοσεύματα μάλιστα ἐν ταύτῃσι τῇσιν ἡμέρῃσι κρίνεται· καὶ τὰ μὲν ἀποφθίνει, τὰ δὲ λήγει, τὰ δὲ ἄλλα πάντα μεθίσταται ἐς ἕτερον εἶδος καὶ ἑτέρην κατάστασιν.

[659] Αἱ μεταβολαὶ τῶν ὡρέων μάλιστα τίκτουσι νουσήματα, καὶ ἐν τῇσιν ὥρῃσιν αἱ μεγάλαι μεταλλαγαὶ ἢ ψύξιος ἢ θάλψιος, καὶ τἆλλα κατὰ λόγον οὕτως.

[660] Hippocrates, *Aphorisms* III, 20-3 Jones=L4.494.16-496.11.

[661] Φυλάσσεσθαι δὲ χρὴ μάλιστα τὰς μεταβολὰς τῶν ὡρέων τὰς μεγίστας, καὶ μήτε φάρμακον διδόναι ἑκόντα, μήτε καίειν ὅ τι ἐς κοιλίην, μήτε τάμνειν, πρὶν παρέλθωσιν ἡμέραι δέκα ἢ καὶ πλείονες.

> At and just before the Dog Star, purging is troublesome.[662] (Hippocrates, *Aphorisms* IV, 5 Jones=L4.502.11-12)

Here, we may assume that because the weather patterns are already bringing much change to the body, it would be dangerous to bring any more physical change to it since the body is reflecting the natural environment and too much change of any kind is harmful to the body.

In the Hippocratic Corpus, the stars were used to mark a time when the seasons changed. The author of *On Regimen* I states that the stars and the seasons correlate and that the seasons are split into four:

> I divide the year into the four parts most generally recognised – winter, spring, summer, autumn. Winter lasts from the setting of the Pleiades to the Spring equinox, spring from the equinox to the rising of the Pleiades, summer from the Pleiades to the rising of Arcturus, autumn from Arcturus to the setting of the Pleiades. [663] (Hippocrates, *On Regimen* III, 68, 194.22-196.2 Joly-Byl=L6.594.9-14)

Similarly, the author of *Airs, Waters, Places,* states that a study of astronomy is important for establishing a timeframe for which to make observations.[664] The author(s) of the *katastaseis* refer to the rising and setting of stars in order to indicate the start of the year they wish to describe:

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[662] Ὑπὸ κύνα καὶ πρὸ κυνὸς ἐργώδεες αἱ φαρμακεῖαι.

[663] τὸν μὲν ἐνιαυτὸν ἐς τέσσαρα μέρεα διαιρέω, ἅπερ μάλιστα γινώσκουσιν οἱ πολλοὶ, χειμῶνα, ἦρ, θέρος, φθινόπωρον· καὶ χειμῶνα μὲν ἀπὸ πλειάδων δύσιος ἄχρι ἰσημερίης ἠαρινῆς, ἦρ δὲ ἀπὸ ἰσημερίης μέχρι πλειάδων ἐπιτολῆς, θέρος δὲ ἀπὸ πλειάδων μέχρι ἀρκτούρου ἐπιτολῆς, φθινόπωρον δὲ ἀπὸ ἀρκτούρου μέχρι πλειάδων δύσιος.

[664] Hippocrates, *Airs, Waters, Places,* 2, l.14-26 Jones=L2.14.10-19.

> In Thasos during autumn, about the time of the equinox to near the setting of the Pleiades, there were many rains...[665] (Hippocrates, *Epidemics* I, 1, l.1-2 Jones=L2.598.1-2)

Again, Galen, in his commentary on *Epidemics* I, comments that by citing the equinox in conjunction with the season of autumn and the position of certain constellations such as the Pleiades, the author was able to pinpoint, with some amount of accuracy, what time of year he is describing in Thasos.[666] Moreover, he states that it is of the highest importance to know the rising and setting of each star since they 'determine' the seasons (περιγράφουσιν αὗται τὰς ὥρας).[667] The correlation of weather patterns with the star phases meant that the general weather pattern over the course of a year for a place could be predicted when one observed the fixed stars and the changes in weather that occurred.

Owing to the fact that the weather had a direct effect on the body and on the disease it suffered, by predicting the weather, the physician could predict the diseases that might attack. In *Airs, Waters, Places,* the physician was required to become familiar with the area he had come to in terms of its change in weather.[668] When he had established the normal climate in a given place, he could go on to observe the normal disease patterns and would soon come to know what diseases occurred in what season:

[665] Ἐν Θάσῳ, φθινοπώρου περὶ ἰσημερίην καὶ ὑπὸ πληϊάδα, ὕδατα πουλλὰ.
[666] Galen, *Commentary on Epidemics I,* I.1, §15, l.17-23.
[667] Galen, *Commentary on Epidemics I,* I.1, §§16-17, l.15-18.
[668] Hippocrates, *Airs, Waters, Places,* 1-2 Jones=L2.11.1-14.18.

> As time and the year passes he will be able to tell what epidemic diseases will attack the city either in summer or in winter...[669] (Hippocrates, *Airs, Waters, Places*, 2, 2.188.13-189.2 Jouanna=L2.14.7-9)

The normal climate for a given place was what the Hippocratic physicians considered healthy because the normal course of diseases occurred. For example, the author of *Airs, Waters, Places* states that:

> As to the seasons, a consideration of the following points will make it possible to decide whether the year will prove unhealthy or healthy. If the signs prove normal when the stars set and rise; if there be rains in autumn, if the winter be moderate, neither too mild nor unseasonably cold, and if the rains be seasonable in spring and in summer, the year is likely to be very healthy.[670] (Hippocrates, *Airs, Waters, Places*, 10, 2.211.12-212.6 Jouanna =L2.42.7-13)

In order to predict, a physician first had to understand the rising and setting of the stars and what seasons they heralded. They then had to establish what weather regularly occurred in a given place over a year.

Any abnormalities in the weather pattern in a given year lead to abnormalities in the patterns of disease. For example, the treatise *Humours* shows how a season deviating from its normal weather pattern can affect disease patterns:

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[669] Τοῦ δὲ, χρόνου προϊόντος καὶ τοῦ ἐνιαυτοῦ, λέγοι ἂν ὁκόσα τε νουσήματα μέλλει πάγκοινα τὴν πόλιν κατασχήσειν ἢ θέρεος ἢ χειμῶνος.

[670] Περὶ δὲ ἐτέων ὧδε ἄν τις ἐνθυμεύμενος διαγιγνώσκοι ὁκοῖόν τι μέλλει ἔσεσθαι τὸ ἔτος, εἴτε νοσερὸν, εἴτε ὑγιηρόν. Ἢν μὲν γὰρ κατὰ λόγον γένηται τὰ σημεῖα ἐπὶ τοῖσι ἄστροισι δύνουσί τε καὶ ἐπιτέλλουσιν, ἔν τε τῷ μετοπώρῳ ὕδατα γένηται, καὶ ὁ χειμὼν μέτριος, καὶ μήτε λίην εὔδιος, μήτε ὑπερβάλλων τὸν καιρὸν τῷ ψύχει, ἔν τε τῷ ἦρι ὕδατα γένηται ὡραῖα, καὶ ἐν τῷ θέρει, οὕτω τὸ ἔτος ὑγιεινότατον εἰκὸς εἶναι.

> When the spring turns out wintry, with after-winter storms, the diseases too are wintry, with coughs, pneumonia or sore throat. So in autumn, should there be sudden and unseasonable wintry weather, symptoms are not continuously autumnal, because they began in their wrong season, but irregularities occur. So seasons, like diseases, can lack crisis or stability, should they break out suddenly, or be determined too soon, or be left behind. For seasons, too, suffer from relapses, and so cause diseases. Accordingly, account must be taken of the condition of the body when the seasons come upon it.[671] (Hippocrates, *Humours*, 13, l.17-28 Jones=L5.494.10-18)

Here, the diseases occurring are directly affected by the unseasonable weather. In addition, the nature of the seasons is directly compared to the nature of disease in terms of how they run, relapse, or come to a crisis. The same is true in the *Epidemics* where the seasons dictate how a disease pattern runs:

> In stable times and years which produce seasonal things at their proper times, diseases are dependable and have proper crises, but in unstable years they are unstable and have bad crises.[672] (Hippocrates, *Epidemics* II, 1, 5, l.1-4 Smith=L5.74.6-11)

Galen states in his *Commentary on Epidemics I*, that 'neither plague nor epidemic' occurs during a year where the seasons change as they should do.[673] Moreover,

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[671] Ὅταν δὲ χειμέριον γένηται ἦρ καὶ ὀπισω ὸ χειμὼν, χειμεριναὶ καὶ αἱ νοῦσοι, καὶ βηχώδεες, καὶ περιπλευμονικαὶ, καὶ κυναγχικαί. Καὶ φθινοπώρου, ἢν μὴ ἐν ὥρῃ καὶ ἐξαίφνης χειμάσῃ, μὴ ξυνεχέως τοιαύτας νούσους ποιέει διὰ τὸ μὴ ἐν ὥρῃ ἦρχθαι,μὴ ξυνεχέως τοιαύτας νούσους ποιέει διὰ τὸ μὴ ἐν ὥρῃ ἦρχθαι, ἀλλὰ ἀνώμαλα γίνεται· διόπερ καὶ αἱ ὧραι ἄκριτοι καὶ ἀκατάστατοι γίνονται, ὥσπερ καὶ αἱ νοῦσοι, ἐὰν προεκρηγνύωνται, ἢ προκρίνωνται, ἢ ἐγκαταλείπωνται· φιλυπόστροφοι γὰρ καὶ αἱ ὧραι γίνονται, οὕτω νοσοποιέουσαι. Προσλογιστέον οὖν, ὁκοίως ἂν ἔχοντα τὰ σώματα αἱ ὧραι παραλαμβάνωσιν.

[672] Ἐν τοῖσι καθεστεῶσι καιροῖσι καὶ ὡραίως τὰ ὡραῖα ἀποδιδοῦσιν ἔτεσιν, εὐσταθέες καὶ εὐκρινέσταται αἱ νοῦσοι, ἐν δὲ τοῖσιν ἀκαταστάτοισιν ἀκατάστατοι καὶ δύσκριτοι.

[673] Galen, *Commentary on Epidemics I*, I.I, §30, l.13-15.

abnormality in the weather does not just cause abnormality in the pattern of disease but also causes disruption in the course of an individual disease:

> In seasons that are normal, and bring seasonable things at seasonable times, diseases prove normal and have an easy crisis; in abnormal seasons diseases are abnormal and have a difficult crisis.[674] (Hippocrates, *Aphorisms* III, 8 Jones=L4.488.13-15)

Weather and disease were so closely linked that by predicting what a season or seasons would be like in the future meant that diseases could also be predicted. The treatise *Humours* even suggests that diseases occurring in the body could be used to predict the weather:

> As it is possible to infer diseases from the seasons, so occasionally it is possible from diseases to forecast rains, winds, and droughts…certain skin diseases, for instance, and pains at the joints are irritating when rain threatens, to quote one example out of many.[675] (Hippocrates, *Humours*, 17, l.1-7 Jones=L5.498.7-11)

However, predicting disease through predicting the weather was more common. This was done in two ways. The first is found in *Airs, Waters, Places* where the weather was schematised into different types of weather pattern such as hot and rainy and the diseases that were associated with this weather took on the nature of the weather such as phlegmatic diseases in a particularly wet and cold year. The second is where the weather alone is schematised into different types of year such as a hot and wet

[674] Ἐν τοῖσι καθεστεῶσι καιροῖσι, καὶ ὡραίως τὰ ὡραῖα ἀποδιδοῦσιν, εὐσταθέες καὶ εὐκρινέες αἱ νοῦσοι γίνονται, ἐν δὲ τοῖσιν ἀκαταστάτοισιν ἀκατάστατοι καὶ δύσκριτοι.
[675] Ὥσπερ δὲ ἐκ τῶν ὡρέων τὰς νούσους ἐστὶ τεκμήρασθαι, ἔστι ποτὲ καὶ ἐκ τῶν νούσων ὕδατα καὶ ἀνέμους καὶ ἀνυδρίας προγινώσκειν…ἔστι γὰρ εὖ μαθόντι καὶ ὀρθῶς, ὅθεν σκεπτέα, οἷον καὶ λέπραι τινὲς καὶ περὶ τὰ ἄρθρα πόνοι, ὕδατα ὅταν μέλλῃ, κνησμώδεές εἰσι, καὶ ἄλλα τοιαῦτα.

year and a true list of diseases noted in order to aid prediction in the future, which is found in the *Epidemics.*

Schematisation of weather and disease in *Airs, Waters, Places*

The treatise *Airs, Waters, Places* offers ways of predicting what different diseases will occur in different weather by schematising both the weather patterns and the disease patterns that occur. In book ten, the author describes the normal, predictable weather pattern that should occur throughout the run of the seasons that makes a year healthy:

> If the signs prove normal when the stars set and rise; if there should be rains in autumn, if the winter should be moderate, neither too mild nor unseasonably cold, and if the rains should be seasonable in spring and in summer, the year is likely to be very healthy.[676] (Hippocrates, *Airs, Waters, Places,* 10, 2.212.1-6 Jouanna =L2.42.8-13)

He then goes on to describe seasons that may not run as expected and what diseases they will bring. For example, in one description he begins with winter stating that if this season is dry and northerly followed by a spring that is rainy and southerly then the summer will be very hot and damp and will bring on acute fevers with dysenteries that affect the phlegmatic constitution most. If this weather continues through the autumn, given that the change at autumn is not healthy, then there will be fatal consequences especially among the women and children.[677] This year is particularly moist in character and we may assume that women, children and the

[676] Ἦν μὲν γὰρ κατὰ λόγον γένηται τὰ σημεῖα ἐπὶ τοῖσι ἄστροισι δύνουσί τε καὶ ἐπιτέλλουσιν, ἔν τε τῷ μετοπώρῳ ὕδατα γένηται, καὶ ὁ χειμὼν μέτριος, καὶ μήτε λίην εὔδιος, μήτε ὑπερβάλλων τὸν καιρὸν τῷ ψύχει, ἔν τε τῷ ἦρι ὕδατα γένηται ὡραῖα, καὶ ἐν τῷ θέρει, οὕτω τὸ ἔτος ὑγιεινότατον εἰκὸς εἶναι.
[677] Hippocrates, *Airs, Waters, Places*, 10, l.11-32 Jones=L2.42.13-44.13..

phlegmatic are particularly targeted by disease in this year because they all have moist natures.[678]

Predictions for the effects of certain weather patterns are also made for other groups such as the bilious and the phlegmatic. This author describes how a change in weather benefitted some constitutions but not others:

> But if the weather be northerly and dry, with no rain either during the Dog Star or at Arcturus, it is very beneficial to those who have a phlegmatic or humid constitution, and to women, but it is very harmful to the bilious. For these dry up overmuch, and are attacked by dry opthalmia and by acute, protracted fevers, in some cases too by melancholies.[679] (Hippocrates, *Airs, Waters, Places,* 10, 2.217.3-10 Jouanna=L2.50.6-12)

The author goes on to describe how the drier weather dries up the watery part of the bile and blood in the bilious and this is why the diseases listed above attack them. Indeed, as we saw in the previous chapter, fevers were brought about by dryness in the body usually during the summer, but here an excessively dry autumn has caused them to be protracted.[680] The phlegmatic, on the other hand, are dried up and this is beneficial for their excessively moist nature since it brings about balance in their nature.

Owing to the fact that disease was a direct result of the weather and that the human body paralleled the natural environment, the nature of the weather dictated

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[678] See above for women and children see section about the effects of the moon:p.110 n.352 and p.177.

[679] Ἢν δὲ βόρειόν τε ᾖ καὶ ἄνυδρον, καὶ μήτε ὑπὸ κύνα ἔπομβρον, μήτε ἐπὶ τῷ ἀρκτούρῳ, τοῖσι μὲν φλεγματίῃσι φύσει ξυμφέρει μάλιστα, καὶ τοῖσιν ὑγροῖσι τὰς φύσιας, καὶ τῇσι γυναιξίν· τοῖσι δὲ χολώδεσι τοῦτο πολεμιώτατον γίγνεται· λίην γὰρ ἀναξηραίνονται, καὶ ὀφθαλμίαι αὐτέοισιν ἐπιγίγνονται ξηραὶ, καὶ πυρετοὶ ὀξέες καὶ πολυχρόνιοι, ἐνίοισι δὲ καὶ μελαγχολίαι.

[680] See above pp.157-160.

the nature of disease for this author. Through observing and predicting the weather of a given place a physician could predict the general diseases and ailments that the inhabitants might suffer. By stating what types of disease occur in what weather and by suggesting that other physicians read the signs in order to predict such weather, the author is offering a way of predicting disease in the following season(s) through predicting the weather for those seasons in any given place.

A different categorisation of different weather patterns and disease patterns can be seen in the *Epidemics.* The author(s) of the *Epidemics* note(s) when the change in weather causes a change in disease. The *katastaseis* in these treatises compile lists of diseases that occurred in certain weather over the course of a year, each *katastasis* dealing with a different type of year in terms of its weather pattern. This compiling of meteorological and nosological information in these treatises is primarily used for prognostic reasons since the disease pattern was a direct result of the weather pattern.

The *Katastaseis* of the *Epidemics*: predicting the weather and disease

The parts of the *Epidemics* that deal with the *katastaseis* describe the weather pattern for the year on the island of Thasos and then list the diseases prevalent in that year below the meteorological description. Volker Langholf has discussed the predictive role of the *katastaseis* in the *Epidemics* linking this role to the observation of the weather in order to predict disease. He argues that the weather in one season dictates the diseases in a subsequent season and that by observing the weather in one season diseases may be predicted for the next or in the third season. I disagree with this suggesting instead that the weather in a given season is the cause of the diseases

occurring simultaneously. The predictive role of the *katastaseis* works by categorising weather and disease into different years characterised by types of weather. The treatise provides a list of diseases that might occur in a certain year that has a certain constitution in terms of its weather. Once a physician had ascertained what type of year was going to ensue in terms of its weather, the physician had a list of diseases that would occur throughout that year because it would follow a set constituation dictated by the weather.

Langholf points out that the word κατάστασις means "'condition,' 'situation,' 'state,'" which can be used for the "'state' of a disease as well as for the 'condition' of the weather."[681] In these parts of the *Epidemics,* the word denotes the state of the year in terms of the prevailing nature of the climate and the prevailing diseases. Langholf notes that often it is not clear whether the *katastaseis* are referring to the environment or to the disease, which reinforces the idea that the natural environment, the human body and its disease patterns are inextricably linked.[682] The meteorological conditions prevalent in the different years described in these treatises are not the normal run of the seasons for Thasos but are years that are different from the normal run of the seasons in terms of their weather patterns where there is a particularly hot year or a particularly dry year, for example.

The author(s) of the *katastaseis* attempted to categorise the 'constitutions' of the year by summing up the general condition of the year and fitting it into a certain schema of 'northerly' or 'southerly' weather conditions. Each *katastasis* represents a different combination of northerly or southerly, wet or dry constitution. The first *katastasis* in *Epidemics* I and the *katastasis* in *Epidemics* III are both describing

[681] Langholf (1990) 169.
[682] Langholf (1990) 169.

southerly constitutions, the former is dry and the latter is wet.[683] The second and third *katastaseis* of *Epidemics* I are describing northerly constitutions, the second is wet, and though the third *katastasis* has no sentence to sum up the general weather, the weather described in the opening sentence suggests that it was generally dry.[684] In some cases, weather is noted that might not necessarily fit with the general theme of the summery of weather patterns in the *katastasis*. For example, in the *katastasis* of *Epidemics* III the author notes:

> Long after the solstice, near the equinox, wintry weather returned, and at the actual equinoctial period there were northerly winds with snow, but not for long.[685] (Hippocrates, *Epidemics* III.3, 2, l.6-8 Jones=L3.68.4-5)

But, he then goes on to say that the year was 'southerly, wet and mild' (νοτίου καὶ ὑγροῦ καὶ μαλθακοῦ) indicating that physicians, though they would sometimes note anomalies, aimed to generalise the weather patterns for the year within a framework of a schematised constitution.[686]

The physician(s) compiling the *katastaseis* are attempting to categorise what different years are like in terms of climate. By categorising and correlating weather and disease over the course of the seasons, a physician could predict what diseases would manifest in a particular year when he had observed what nature the year was going to take on. Indeed, there is a history of correlating the weather with disease found in Homer and Hesiod both of whom correlate the rise of the Dog Star with fevers and who predict the onset of fever with the rising of this star and the change in

[683] Hippocrates, *Epidemics* I, 1, l.1-7 Jones=L2.598.1-7 and III, 3, 2, l.1-15 Jones= L3.66.12-70.2.
[684] Hippocrates, *Epidemics* I, 1, 4 and 5, l.1-4 and I, 13 l.1-13 Jones=L.2.614.6-616.5, 616.5-8 and 638.7-640.2.
[685] Μετὰ δὲ ἡλίου τροπὰς ὕστερον πολλῷ, πλησίον ἰσημερίης, ὀπισθοχειμῶνες· καὶ ἤδη περὶ ἰσημερίην, βόρεια, χιονώδεα, οὐ πουλὺν χρόνον.
[686] Hippocrates, *Epidemics* III, 3, 2 l.13 Jones=L.3.68.9.

weather. Also, *Airs, Waters, Places* shows an attempt to read the signs brought on by the weather to predict what type of year would ensue. For example, he suggests noting the weather at the time of the Dog Star to see if the diseases of summer would cease in the autumn or whether they would carry on and cause fatalities.[687] If a physician who had compiled a list of diseases under a schematised weather pattern could read the signs in this way and predict what constitution a year might take on in terms of its weather such as a southerly and dry year, then he could refer to the diseases he listed for such a year and predict the disease pattern.

Langholf suggests that the *katastaseis* are indeed aimed at aiding prognosis but in a different way arguing that:

> The author(s) do(es) not seem to be primarily interested in the relationship between the weather of a certain season and the *simultaneous* diseases but rather in the relationship between the weather of one season and the diseases of another *subsequent* season. The interest seems to be prognostical: what is the future effect of given weather conditions on the occurrence of diseases, or on the health of people? (Langholf, 1990, 172)

As Langholf suggests, the previous seasons are in some ways responsible for the diseases in a third based on what diseases are continued and which diseases are terminated by the weather in the third seasons. But I would argue that the weather's direct effect on the body is primarily responsible for the change in disease. For example, in the *katastaseis* the change in weather from season to season is noted to have direct effects on the course of diseases:

[687] Hippocrates, *Airs, Waters, Places*, 10, l.25-32 Jones=L2.44.7-13.

> In all the cases described spring was the worst enemy, and caused the most deaths.[688] (Hippocrates, *Epidemics* III. 3, 15, l.1-2 Jones=L3.98.6-7)

In addition, there is substantial evidence in the Hippocratic Corpus that supports the idea that it is the direct effect of the weather that produces the diseases in a micro-/macrocosm model, which was discussed in Chapter two of this thesis. Thus, just because the weather in the third season is often not mentioned in relation to the effects on the course of disease in the *katastaseis*, does not mean that the simultaneous weather patterns are not affecting the disease. Indeed, it is likely that if the weather patterns deviated from the current constitution, the diseases would change because the body works as part of a micro-/macrocosm where it parallels the weather.

For the Hippocratic physicians, a continuation of a distinct weather pattern or its complete change had a direct effect on disease. Thus, the prognostic interest in the *katastaseis* lies in how the weather runs in a given constitution and the diseases that are a direct result of that weather. By comparing the *katastaseis* to the predictive methods used in Hesiod, Homer and in *Airs, Waters, Places* where a direct correlation is made between a change in weather and a change in disease, it is more likely that the *katastaseis* are aiming to predict changes in disease caused by simultaneous weather patterns rather than observing the weather in one season in order to predict disease occurring in the next seasons as Langholf suggests. Once a physician had established what constitution the year would take on, he could predict what state the climate would be in for the subsequent seasons, as it would follow the run of the constitution. From this, he could then predict the diseases that were likely

[688] Ἦν δὲ πᾶσι τοῖσιν ὑπογεγραμμένοισι χαλεπώτατον μὲν τὸ ἔαρ, καὶ πλείστους ἀπέκτεινε.

to occur and the course they might follow because the diseases were directly effected by the weather pattern.

When we consider that the Hippocratic physicians believed the pattern of the weather and the pattern of disease to be linked, it is important to explore how these two cycles of phenomena correlated in terms of their timeframes. For example, it is obvious that the cycles of weather patterns have a specific timeframe of a year. However, the ancient physicians believed that diseases also fitted into a specific timeframe. For example, diseases had life cycles that would run their course depending on a series of factors, many of which were linked to the timeframes in which the weather took its course:

> When diseases arise in spring, expect their departure in autumn. Such diseases as arise in autumn must have their departure in spring. Whenever a disease passes these limits, you may know that it will last a year.[689] (Hippocrates, *On the Nature of Man*, 8, 186.18-19 Jouanna=L6.50.17-19)

> For with the seasons men's diseases, like their digestive organs, suffer change.[690] (Hippocrates, *Airs, Waters, Places*, 2, 2.189.13-14=L2.14.18-19)

On close examination of the *Epidemics* where information regarding the environment and men's diseases is collated, it becomes clear that the cycles of weather and the cycles of disease may not necessarily be strictly simultaneous in occurrence in these descriptions. The constitution of the weather is described in all of the *katastaseis* from autumn time to summer time. When one takes into consideration how the Hippocratic physicians viewed the seasons, autumn seems to

[689] Ὁκόσα δὲ ἦρος γίνεται νουσήματα, προσδέχεσθαι χρὴ φθινοπώρου τὴν ἀπάλλαξιν ἔσεσθαι αὐτέων· ὁκόσα δὲ φθινοπωρινὰ νουσήματα, τουτέων τοῦ ἦρος ἀνάγκη τὴν ἀπάλλαξιν γενέσθαι· ὅ τι δ' ἂν τὰς ὥρας ταύτας ὑπερβάλλῃ νούσημα, εἰδέναι χρὴ ὡς ἐνιαύσιον αὐτὸ ἐσόμενον.
[690] Ἅμα γὰρ τῇσιν ὥρῃσι καὶ αἱ κοιλίαι μεταβάλλουσιτοῖσιν ἀνθρώποισιν.

be the logical time of year for a change in the year's constitution since autumn was generally seen to be a season of great change in both the Hippocratic Corpus and earlier works such as Hesiod's *Works and Days*.[691]

However, when listing the diseases in each season, the *katastaseis* vary in the time of year they begin and end. For example, both the second and third *katastaseis* in *Epidemics* I (Hippocrates, *Epidemics* I, 4-12 and I, 13-26 Jones=L2.614.6 and 638.7-682.2 respectively) run from winter to the winter of the next year when describing the prevailing diseases. Whereas the *katastasis* in *Epidemics* III (Hippocrates, *Epidemics* III, 3, 2-16 Jones=L3.66.12-102.10) runs from winter to autumn and the first *katastasis* in *Epidemics* I (Hippocrates, *Epidemics* I, 1 1-3 Jones=L2.598.1-2) runs from spring to winter.

To take the *katastaseis* that begin their description of disease in winter first (the second and third *katastasis* in *Epidemics* I and the *katastasis* in *Epidemics* III), it seems logical to start a description of diseases in winter after the great period of change in autumn as it was especially during autumn that the Hippocratic physicians believed that the diseases would change or take on a new form.[692] This was due to the changes in weather brought on by the nature of autumn, which, for the Hippocratic physicians, was characterised by frequent and great changes in weather throughout the month.[693] Another reason for beginning the description of diseases in winter could be that, having observed autumn, it is clear what type of constitution the

[691] Hippocrates, *Airs, Waters, Places,* 6, l.22-5 Jones=L2.26.6-7; 11, l. 7-11; *Prognostic,* 24, l.15-20 Jones=L2.182.1-5; Hesiod, *Works and Days,* 415-417.
[692] Hippocrates, *Prognostic,* 24, l.15-20 Jones=L2.182.1-5; *Airs, Waters, Places,* 11, l.7-15 Jones=L.52.1-7
[693] Hippocrates, *Airs, Waters, Places,* 6, l.22-5; 11, l.7-11Jones=L2.26.4-7, 52.1-4 *Aphorisms,* III. 4 Jones=L4.486.10-12.

year is going to take on. Indeed, many other Hippocratic texts start their description of diseases or advice about how to combat disease in winter.[694]

There is, however, a problem with this idea as the winter of the next year is included in the second and third *katasasis* of *Epidemics* I and the *katastasis* in *Epidemics* III, which obviously would have to run past autumn. However, when the weather for autumn is mentioned in the third *katastasis* of *Epidemics* I, it has the same weather as that described at the beginning of the text.[695] Thus, the autumn time mentioned here is part of the same constitution rather than the heralding of a new constitution. In *Airs, Waters, Places,* the author notes that autumn can herald a turning point in both the weather and in disease but this is not always the case:

> If at the rising of the Dog Star stormy rain occurs and the Etesian winds blow, there is hope that the diseases will cease and that the autumn will be healthy. Otherwise there is a danger that deaths will occur among women and children and least of all among the old men; and that those who get better will lapse into patients with quartan fevers, and from quartan fevers into dropsies.[696] (Hippocrates, *Airs, Waters, Places,* 10, 2.213.5-214.3 Jouanna =L2.44.8-13)

In the *katastasis* of *Epidemics* III, however, the author seems to describe diseases from early spring to the autumn of the next year, which is when this particular constitution ended presumably, signalling that autumn is heralding a change in

[694] Hippocrates, *Regimen* III, 68, l.10-20 Jones =L6.594.9-16; *On the Nature of Man*, 7, l.1-4 Jones=L6.46.1-3.
[695] Hippocrates, *Epidemics* I.13 and 14 Jones=L2.638.7-640.8 and 640.8-642.12.
[696] Καὶ ἢν μὲν ἐπὶ κυνὸς ἐπιτολῇ ὕδωρ ἐπιγένηται καὶ χειμὼν, καὶ οἱ ἐτησίαι πνεύσωσιν, ἐλπὶς παύσασθαι, καὶ τὸ μετόπωρον ὑγιηρὸν γενέσθαι· ἢν δὲ μὴ, κίνδυνος θανάτους τε γενέσθαι τοῖσι παιδίοισι καὶ τῇσι γυναιξὶ, τοῖσι δὲ πρεσβύτῃσιν ἥκιστα, τούς τε περιγενομένους ἐς τεταρταίους ἀποτελευτᾷν, καὶ ἐκ τῶν τεταρταίων ἐς ὕδρωπας.

constitution. Again, in the first *katastasis* of *Epidemics* I, the physician notes that the constitution of the year changed in spring:

> ...but early in the spring, as the previous constitution had proved the opposite and northerly...[697] (Hippocrates, *Epidemics* I,1, l.9-10 Jones =L2.598.8-9)

Indeed, spring could be seen as a prominent point of change since some texts describe spring as a dangerous period of time.[698] The physician(s) writing the *katastaseis* seem(s) to take the view that spring is a period characterised by change and is thus a dangerous time for patients suffering from disease.[699]

Despite the beginning of the first *katastasis* occurring in spring, the physician still describes the constitution from autumn onwards in the first section, rather than beginning his description from the time when the *katastasis* changed. In addition, it should be noted that the author of the *katastasis* in *Epidemics* III, seems to stop his descriptions of disease at the next autumn, which is when the *katastasis* presumably changed again. Galen suggests in his commentary that whenever Hippocrates describes the *katastasis* for the year he starts his account from the point the weather departs from its natural condition.[700] In other parts of the Hippocratic Corpus, description of the weather tends to start from autumn. For example, the author of *Airs, Waters, Places* also starts with autumn when describing the normal meteorological conditions that will indicate a healthy year.[701]

In each case, therefore, the timeframe of the *katastaseis* starts either the season after a season of great change, i.e. winter after autumn, or in a season of

[697] πρωὶ μὲν τοῦ ἦρος, ἐκ τῆς πρόσθεν καταστάσιος ὑπεναντίης καὶ βορείου γενομένης.
[698] Hippocrates, *Airs, Waters, Places,* 5 and 11 Jones=L2.22.15-24.9, 50.17-52.9; *Aphorisms* III, 9, l.1-2 Jones=L4.488.16-17.
[699] Hippocrates, *Epidemics* III, 15, l.1-2 Jones=L3.98.6-7.
[700] Galen, *Commentary on Epidemics I,* I.10, §48. l.12-15.
[701] Hippocrates *Airs, Waters, Places,* 10, l.4-7 Jones=L2.42.8-10.

change i.e. spring. They also end the season before a period of change i.e. winter before spring or in a season of change i.e. autumn.

It is reasonable to suggest from an examination of these timeframes that the meteorological description at the beginning of each *katastasis* does not necessarily have to limit the weather's constitution to the cycle of a year. Instead, the meteorological conditions are described in this way in order to include each season beginning with autumn as we would begin with January and ending in summer as we would end in December. The meteorological conditions experienced in the *katastasis* may extend past the cycle of a year, which only becomes apparent in the description of diseases. It is, therefore, normal for the description of diseases to go outside the timeframe of the yearly cycle as the *katastaseis* do not necessarily run by a strict yearly timeframe.

By correlating the weather patterns and disease patterns over a period of years and by observing the fixed stars and the signs they produced, the physicians could predict both the weather and the disease pattern that was dictated by it. If the signs were normal at key stages in the year then a normal year in terms of weather would follow with healthy disease patterns that were easily predicted. If the signs were not normal at these times of year then there was a danger that the weather would deviate from its normal pattern and bring on a strange disease pattern.

The author of *Airs, Waters, Places* sets out what these signs might look like in book ten of his treatise and states what course the disease patterns might take as a result of the ensuing weather. The ancient physician(s) compiling the *katastaseis* attempted to categorise years where the weather pattern was different from the

normal weather experienced in a given place in an attempt to categorise the different disease patterns and predict them. By noting down what actual diseases occurred, a physician could refer back to these lists once he had established what type of year was going to ensue in terms of its weather and then prepare himself for the diseases that occurred the last time a year of a certain nature occurred. Unlike the author of *Airs, Waters, Places,* the physician(s) compiling the *katastaseis* are not stating that the nature of the diseases will be the same as the nature of the weather but the prognostic aim is still the same as that in *Airs, Waters, Places* where predicting the meteorological nature of the year can help with predicting the disease patterns that might ensue. This is not to say that the *katastaseis* disproves their dependence on meteorological events to predict diseases following a micro-/macrocosm model, only that the model they are following may in fact be different to that of *Airs, Waters, Places.* Or it could be argued that this is the beginning of the schematisation process where the weather is schematised and the diseases noted down in order to be schematised. According to this argument, it could be suggested that the *katastaseis* are a test of the idea presented throughout the Hippocratic Corpus that certain weather causes certain disease.

Conclusions

To conclude, the climate has a direct effect on both the land and the inhabitants of a given place shaping the appearance and character of the inhabitants from the seed. This can be seen in particular in *Airs, Waters, Places* with the description of a mountainous rugged landscape where the men are big and wild in nature and with that of the the flat, cultivated landscape where the people are more tame and grow

well. These ideas are taken further with the Scythian race whose strange landscape, which is half mountain half plain, produces a strange race which is half reflective of the mountain and half reflective of the plain.

Not only did the climate shape the character and appearance of its inhabitants but it also dictated its disease patterns. Where the climate was uniform with little change in weather pattern so the disease patterns were not varied and people tended to suffer from the same ailments throughout the year. Where the seasonal weather pattern varied the disease pattern also varied bringing different diseases in each season or changing the nature of the diseases already manifest from the season before.

Owing to the fact that the weather was so closely linked to the disease pattern, diseases became predictable. By observing the stars, the physicians marked out the boundaries for when the seasons changed and looked out for signs that might tell them whether the weather would prove to be the regular weather pattern experienced by a particular place or whether it would take a different course. Any irregularities in the weather pattern would lead to irregularities in the disease patterns, which a physician could then prepare for. Both *Airs, Waters, Places* and *Epidemics* attempt to predict what type of diseases would occur in what type of weather. *Airs, Waters, Places* matches the nature of the disease to the nature of the weather where the human body reflects the climate. The *katastaseis* do not schematise the diseases by matching them to a weather pattern like in *Airs, Waters, Places,* but offer a list of diseases that may occur should a particular year have a particular nature.

Conclusion

This thesis has explored the micro-/macrocosmic relationship between the human body and the natural environment going beyond the modern scholarship in tracing this link. Micro-/macrocosm theories can be traced throughout the texts examined in this thesis. In medical and philosophical texts we sometimes find a very clear statement of the connections between mankind and the universe as in *On Sevens* and *On Regimen* I. Other texts present the micro-/macrocosm by implication and we find parts of the body described metaphorically as parts of the natural world. The most common type of exposition of a micro-/macrocosm mode of thinking is found in analogies drawn between natural world and human physiology and bodily processes or descriptions of the human body and its processes that are identical to those given for the natural world. The systems at work within the body reflect the various systems at work in the natural environment because it is a product of the natural world and because powers work in the same way and have the same relationships in both the natural world and in the human body. This applies to all natural phenomena in all parts of the universe because a body reflects the universe in all its parts.

This thesis has also attempted to shed new light on the links between ideas presented in ancient cult practice and mythology which may be compared to the theories offered by ancient physicians and philosophers. Ideas that are found in these two different spheres of thought are strikingly similar and ultimately come to the same conclusions about the effects of the natural world on the human body. They also show the micro-/macrocosm model is embedded in mythological thought as well as in the logical explanations of philosophy and medicine.

The origins of the micro-/macrocosm model may be traced to the idea that the human body was originally born from the mingling of earth and heavens and as such is a copy of its parents. The female reflects the earth where both act as an incubator and provide material from which a body can be made. The male reflects the heavens carrying the warm and moist seed that puts life into matter and which is akin to heat emanating from the heavens that can cause spontaneous generation in the earth as well as rains and rivers that fertilise the earth. As a result, the human body continues to be a microcosm of the natural world through its reproductive process since these reflect the original formation of mankind where the materials from male and female parallel those originating from heaven and earth.

For the ancient physician attempting to draw explanations of disease from the natural environment, natural powers work differently from divine powers since the substances that contain them enter or invade the body and also pass out of it often leaving it deficient in some way. Indeed, powers in the natural world not only come into the body by the nose or mouth or by passing through the skin and then alter bodily functions but powers such as heat and moisture could be drawn of the body by change in the natural world.

Heat in its non-generative capacity and cold have the same effects on the human body as they do on the natural environment. Heat always draws moisture to itself. It can have differing effects either drying a body out or moistening it depending on where the heat is. The sun will dry a body out since the heat draws moisture up towards it and away from bodies below it but the south wind will bring moisture and deposit it on or in the bodies because its heat makes it naturally moist. Cold also has a moistening and drying effect. A colder land where the sun does not shine for very long is misty and rainy and thus home to phlegmatic inhabitants but a cold wind contracts and clears waters on the earth and fluids in the body ridding both air and body of turbid moistures.

Owing to the fact that powers such as heat and cold had the same effects on the natural environment as they did on the human body, the natures of different natural events such as a cold wind or a hot day extended to the natures of the human body making the body reflect its natural environment. As such, the nature of disease also reflected the natural environment. Any excess or imbalance in the natural environment would lead to an excess in the body and therefore disease and this is what physicians attempted to counter and explains why they paid such keen attention to change in weather.

The texts examined in this thesis show a recognition that the meteorological conditions, the hydrology, and the general climate was not the same everywhere and that it could be subject to change. The overall nature of a particular place extended to the human bodies that inhabited that place causing the body to reflect the natural environment into which it was born. This conditioning of the human body began at the level of the seed meaning that a change of place would not fundamentally affect or change a body. As a result, we do not find physicians recommending a change of

climate for health reasons since this could not properly cure an ailment brought on by the natural constitution of the body.

Basing himself on the assumption that human bodies reflected the nature of their natural environment, a physician could ascertain what the general nature of the inhabitants was and could also predict their diseases by establishing the general climate of a certain place since the nature of the climate also extended to their diseases. In preparation for diseases that were about to attack the population, a physician could attempt to predict the change in weather by observing signs in the natural environment and by schematising weather patterns and their attendant disease patterns. The physicians not only accounted for a place's general climate in this instance but also for years when strange weather occurred and when seasonal variation changed the patterns of disease from what was the norm.

The processes occurring in the hidden innards of the human body were deduced by observing what was occurring in the natural environment and imprinting those processes onto the human body. Where one could understand the universe, one could understand the human body, and vice versa. This thesis has shown in detail that this idea was based on the fundamental and deep-seated theory that the human body was considered a microcosm of its universe and reflected the nature and all the changes of its natural environment.

Bibliography

Primary Sources: texts and commentaries

Aeschylus (2009) *Agamemnon*, Sommerstein, A.H. ed. and transl. Cambridge: MA.

(2009) *Danaids* and *Psuchogogoi* in *Fragments of Aeschylus* Sommerstein, A.H. ed. and transl. Cambridge: MA.

(2009) *Prometheus Bound*, Sommerstein, A.H. ed. and transl. Cambridge: MA.

Aelius Aristides (1981) *The Complete Works*, Behr, C.A. transl. Berlin.

Anonymus Londinensis (1947) *The Medical Writings of Anonymus Londinensis*, Jones, W.H.S. and Diels, H. transl. Cambridge.

Aristotle (1831) (repr. De Gruyter, 1960) *Aristotelis opera*. vol. 2. (*Problems*) Bekker, I. ed. Berlin.

(1913) *Aristotelis de animalium motione et de animalium incessu. Ps.-Aristotelis de spiritu libellus*. Jaeger W. ed. Leipzig.

(1919) *Aristotelis meteorologicorum libri quattuor*. Fobes, F.H. ed. Cambridge.

(1950) (repr. 1966 [1st edn. corr.]) *Aristotelis physica*. Ross, W.D. ed. Oxford.

(1955) (repr. 1970), *Aristotle. Parva naturalia*. Ross, W.D. ed. Oxford.

(1956) *Aristote. Les parties des animaux*. Louis, P. Paris.

(1957) (repr. 1964) *Aristotelis politica*. Ross, W.D. ed. Oxford.

(1961) *De la Génération des Animaux.* Louis, P. ed. Paris.

(1964) *Aristote. Histoire des animaux*. vols. 1-3. Louis, P.ed. Paris.

(1965) *Aristote. Du ciel*. Moraux, P. ed. Paris.

(1965) *Aristotelis de generatione animalium*. Drossaart Lulofs, H.J.ed. Oxford.

(1966) *Aristote. De la génération et de la corruption*. Mugler, C. ed. Paris.

(1982) *Aristote Météorologiques.* Tome I- II. Louis, P.ed. Paris.

(1984) *The Complete Works of Aristotle,* Vols. 1- 2. Barnes, J. ed. Princeton.

(1991) *Aristote: Problèms.* Louis, P. ed. Paris.

(2001) *Aristotle On the Parts of Animals.* Lennox, J. ed. Oxford.

Diels, H and Kranz, W. (1952) *Die Fragmente der Vorsokratiker* Vol.1-3. Berlin.

Diodorus Siculus, (1939) *The Library of History.* Oldfather, C.H. transl. Cambridge: MA.

Diogenes Laertius, (1925) *Lives of Eminent Philosophers.* Hicks, R.D. transl. Cambridge: MA.

Edelstein, E.J. and Edelstein, L. (1998) *Asclepius: collection and interpretation of the testimonies.* Baltimore; London.

Etymologicum Magnum 1848 (repr. Amsterdam: Hakkert, 1967*)* T. Gaisford, ed. Oxford.

Euripides (1981) *Eurpides, Heracles.* Bond, G.W. comm. Oxford.

(1998) *Heracles,* Kovacs, D. transl. Cambridge: MA.

(2002) *Helen,* Kovacs, D. transl. Cambridge: MA.

(2003) *Bacchae,* Kovacs, D. transl. Cambridge: MA.

Fortenbaugh, W. W. and Schütrumpf E. (2001) *Dicaearchus of Messana: text, translation, and discussion,* London.

Galen (1934) *Commentary on Epidemics I,* Wenkenbach, E. and Pfaff, F. ed. *CMG:* V.10.1. Berlin.

(1982) *Commentary on the Hippocratic treatise, Airs, waters, places:in the Hebrew translation of Solomon ha-Me'ati*. Wasserstein, A. ed. Israel; Jerusalem.

Herodotus (1920) *Histories,* Godley, A.D. transl. Cambridge: MA.

Hesiod, (1987) *Hesiod: Theogony* Caldwell, R. transl. comm. Cambridge.

(1999) *Theogony and Works and Days.* West, M.L. transl.. comm. Oxford.

(2006) *Theogony,* Most, G.W. ed. transl. Cambridge: MA.

(2006*) Works and Days,* Most, G.W. ed. transl. Cambridge: MA.

Hippocrates (1839-61) *Oeuvres complètes d'Hippocrate*. Littré, É. ed.comm.transl. Paris.

(1923) *Ancient Medicine, Airs, Waters, Places, Epidemics* I and III, *The Oath, Nutriment.* Jones, W.H.S. transl. Cambridge: MA.

(1923) *Prognostic, Regimen in Acute Diseases, On the Sacred Disease, On the Art, Breaths.* Jones, W.H.S. transl. Cambridge: MA.

(1928) *On Wounds in the Head, In the Surgery, Fractures, Joints.* Withington, E.T. transl. Cambridge: MA.

(1931) *On the Nature of Man, Regimen in Health, Humours, Aphorisms, Regimen* I-III. Jones, W.H.S. transl. Cambridge: MA.

(1971) *On Sevens,* in West, M.L. "The Cosmology of 'Hippocrates,' De Hebdomadibus." *The Classical Quarterly,* 21. 2: 365-88.

(1975) Hippocratis *De natura hominis* CMG I 1,3, ed. transl. comm. Jouanna. J. Berlin**.**

(1984) *Hippocrate: Du Regime* CMG I 2,4 Joly, R. and Byl, S. edd.transl. comm. Berlin

(1988) *Des Vents, de l'Art,* Jouanna, J. ed. transl. comm. Paris.

(1988) *Diseases* III, *Internal Affections, Regimen in Acute Diseases.* Potter, P. transl. Cambridge: MA.

(1988) *Affections, Diseases* I, *Diseases* II. Potter, P. transl. Cambridge: MA.

(1990) *l'ancienne médicine.* Jouanna, J. ed. transl. comm. Paris.

(1994) *Epidemics,* II, IV, V, VI, VII. Smith, W.D. transl. Cambridge: MA.

(1995) *On Places in Man, Fleshes, Use of Liquids.* Potter, P. transl. Cambridge: MA.

(1996) *Airs, Eaux, Lieux.* Jouanna, J. ed. transl. comm. Paris.

(1998) *On Places in Man.* Craik, E. ed. transl. comm. Oxford.

(2003) *La Maladie Sacrée.* Paris.

(2010) *Nature of Bones, Eight Months' Child.* Potter, P. transl. Cambridge: MA.

(2012) *Generation, Nature of the Child, Diseases* IV, *Nature of Women, Barrenness.* Potter, P. transl. Cambridge: MA.

(2014) Hippokrates: über die säfte. CMG I 3,1. Overwien, O. ed. transl. comm. Berlin.

Homer (1924-5) *Iliad,* Murray, A.T. transl. Wyatt, W.F. rev. Cambridge: MA.

(1924-5) *Odyssey,* Murray, A.T. transl. Dimock, G.E. rev. Cambridge: MA.

Homeric Hymn to Gaia, (2004) *The Homeric Hymns,* Rayor, D.J. transl. Berkeley; London.

Homeric Hymn to Demeter, (2004) *The Homeric Hymns,* Rayor, D.J. transl. Berkeley; London.

Isocrates (1928) *Panegyricus.* Norlin, G. transl. Cambridge: MA.

(1945) *Evagoras.* Norlin, G. transl. Cambridge: MA.

Jacoby, F. (1957) *Die Fragmente der Griechischen Historiker.* Leiden.

Kirk, G.S., Raven, J.E., and Schofield, M. (1983) *The Presocratic Philosophers: a critical history with a selection of texts,* 2nd edition. Cambridge.

Lexicon Iconographicum Mythologiae Classicae (LIMC**)** 1999 Düsseldorf.

Longrigg, J. (1998) *Greek Medicine from the Heroic to the Hellenistic age: a source book.* Eastbourne.

Menander (1979) *Dyskolos,* Arnott, G.W. transl. Cambridge: MA.

Pausanias (1918-35) *Description of Greece,* Jones W.H.S. transl. Cambridge: MA.

Plato (1914) *Phaedrus.* Fowler, H.N. transl. Cambridge: MA.

(1924) *Protagoras.* Lamb, W.R.M. transl. Cambridge: MA.

(1926) *Laws,* Bury, R.G. transl. Cambridge: MA.

(1929) *Menexenus.* Bury, R.G. transl. and ed. Cambridge: MA.

(1929) *Timaeus.* Bury, R.G. transl. and ed. Cambridge: MA.

Poetae Comici Graeci (PCG), (1983) Kassel, R. and Austin, C. edd. Vol.4, Berlin.

Scholia in Aristophanem. Pars 3. (1999-2007) Chantry, M. et al. transl. and ed. Groningen.

Sophocles, (1994) *Oedipus The King,* Lloyd-Jones, H. transl. Cambridge: MA.

Thucydides, (1919-23) *History of the Peloponnesian War,* Smith, C.F. transl. Cambridge: MA.

Tragicorum Graecorum Fragmenta, (1986) Snell, B. and Radt, S.L. ed. Göttingen

Xenophon, (1925) *On Hunting*, Marchant, E.C. and Bowerstock, G.W. transl. and ed. Cambridge: MA.

Secondary Sources

Ahonen, M. (2014) *Mental Disorders in Ancient Philosophy.* Cham.

Allen, R.E. (1984) *The Dialogues of Plato.* Yale; London.

Barnes, J. et al. (1995) *The Cambridge Companion to Aristotle.* Cambridge.

Bartos, H. (2015) *Philosophy and Dietetics in the Hippocratic On Regimen.* Leiden; Boston.

Brulotte, E.L. (2002) 'Artemis: her Peloponnesian abodes and cults' *Peloponnesian Sanctuaries and Cults.* Hägg, R. Stockholm. 179-182.

Burkert, W. (1985) *Greek Religion.* Raffar, J. transl. Oxford.

Buxton, R.G.A. (1992) 'Imaginary Greek Mountains' *JHS* 122: 1-15.

Buxton, R.G.A. (1994) *Imaginary Greece: the contexts of mythology.* Cambridge; New York.

Cole, S.G. (2004) *Landscapes, Gender, and Ritual Space: the ancient Greek experience.* Berkeley.

Collinge, N.E. (1962) 'Medical terms and clinical attitudes in the tragedians.' *BICS* 9:43-55.

Connell, S.M. (2016) *Aristotle On Female Animals.* Cambridge.

Cook, A.B. (1925) *Zeus*: *a study in ancient religion.* Cambridge.

Craik, E.M. (2015) *The 'Hippocratic' Corpus: content and context.* London.

Craik, E.M. (2001a) 'Thucydides on the plague: physiology of flux and fixation.' *The Classical Quarterly* 51.1:102-8.

Craik, E.M. (2001b) 'Medical reference in Euripides,' *BICS* 45: 81-95.

Crouch, D, P. (2004) *Geology and Settlement: Greco-Roman Patterns.* Oxford.

Curd, P. (1996) *A Presocratic Reader.* Indiana.

Dean-Jones, L. (1994) *Women's Bodies in Classical Greek Science.* Oxford.

Dodds, E.R. (1951) *The Greeks and the Irrational.* Boston.

DuBois, P. (1988) *Sowing the Body: psychoanalysis and ancient representations of women.* Chicago.

Dunant, E. (2008) *Water in Sanctuaries and Sacred Places: Attica, Boeotia, Corinthia, and the Argolid.* Unpublished Doctoral Thesis.

Edelstein, L. (1967) *Ancient Medicine: selected papers of Ludwig Edelstein.* Temkin, O. and Temkin, edd. C.L. Baltimore.

Eijk, P. van der (2005) *Medicine and Philosophy in Classical Antiquity: doctors and philosophers on nature, soul, health, and disease.* Cambridge.

Erotian, (1918*) Hippocratic Lexicon*. Nachmanson,E. ed. Göteborg.

Fowler, R. L. (1993) 'The Myth of Kephalos as an Aition of Rain-Magic (Pherekydes FGrHist 3 F 34)' *Zeitschrift für Papyrologie und Epigraphik:* 97. Bonn. 29-42.

Freudenthal, G. (1995) *Aristotle's Theory of Material Substance: heat and* pneuma, *form and soul.* Oxford.

Frixione, E. (2013) '*Pneuma*-fire interactions in Hippocratic physiology.' *Journal of the History of Medicine and Allied Sciences* 68 (4): 505-528.

Furley, D.J. and Wilkie, J.S. (1984) *Galen on Respiration and the Arteries.* Princeton.

Gallop, D. (1991) *Aristotle On Sleep and Dreams.* Oxford.

Garland, R. (1990) *The Greek Way of Life: from conception to old age.* London.

Goette, H.R. (2001) *Athens, Attica, and the Megarid: an archaeological guide.* London.

Gregory, A. (2013) *The Presocratics and the Supernatural.* London.

Griffiths, E. (2006) *Euripides: Heracles.* London.

Guthrie, W.K.C. (1962-81) *A History of Greek philosophy.* Vol. 2. Cambridge.

Guthrie, W.K.C. (1957) *In the Beginning: some Greek views on the origins of life and the early state of man.*. London.

Guthrie, W.K.C. (1971) *The Sophists*, Cambridge.

Harris, C.R.S. (1973) *The Heart and the Vascular System in Ancient Greek Medicine, from Alcmaeon to Galen.* Oxford.

Holberg, J.B. (2007) *Sirius, Brightest Diamond in the Night Sky.* Berlin.

Holmes, B. (2010) *The Symptom and the Subject: The emergence of the physical body in Ancient Greece.* Princeton.

Horden, P. and Purcell, N. (2000) *The Corrupting Sea: A study of Mediterranean history.* Oxford.

Inwood, B. (1992) *The Poem of Empedocles: a text and translation.* London.

Irby-Massie, G. (2008) '*Prometheus Bound* and contemporary trends in Greek natural philosophy.' *Greek, Roman, and Byzantine Studies* 48.2: 155-57.

Janko, R. ed. (1991) *The Iliad. A Commentary.* Vol 4. Cambridge.

Joly, R. (1983) 'Hippocrates and the school of Cos.' *Nature Animated,* ed. Ruse, M. Dordrecht. 29-47.

Jouanna, J. (2012) *Greek Medicine from Hippocrates to Galen.* Paris.

King, H. (1998) *Hippocrates' Woman: reading the female body in ancient Greece.* London.

Kirk, G.S. Raven, J.E. and Schofield, M. (1983) *The Presocratic Philosophers: a critical history with a selection of texts.* 2nd ed. Cambridge.

Kühn, J-H. ed. *Index Hippocraticus.* Gottingae.

Lambridis, H. (1976) *Empedocles.* Alabama.

Langdon, M.K. (1976) 'A sanctuary of Zeus on Mount Hymettos.' *Hesperia: Supplement XVI.* Princeton. 1-148.

Langdon, M.K. (2000) 'Mountains in Greek Religion,' *The Classical World.* 93.5: 461-70.

Langholf, V. (1990) *Medical Theories in Hippocrates: early texts and the 'Epidemic.'* Berlin.

Larson, J. (2001) *Greek Nymphs*: *myth, cult, lore.* Oxford.

Larson, J. (2010) 'A Land Full of Gods: Nature Deities in Greek Religion.' *A Companion to Greek Religion,* ed. Ogden, D. Oxford. 56-70.

LeBlay, F. (2005) 'Microcosm and macrocosm: the dual direction of analogy in Hippocratic thought and the meteorological tradition.' *Hippocrates in Context: papers read at the XIth International Hippocrates Colloquium, University of Newcastle Upon Tyne, 27-31 August 2002,* ed. van der Eijk, P. Lieden. 251-269.

Lehoux, D. (2007) *Astronomy, Weather and Calendars in the Ancient World: parapegmata and related texts in classical and Near Eastern Societies*. Cambridge.

Liddell-Scott-Jones *Greek-English Lexicon.*

Liewert, A. (2015) *Die meteorologische Medizin des Corpus Hippocraticum.* Berlin.

Lloyd, G.E.R. (1964) 'The Hot, the Cold, the Dry and the Wet in Greek Philosophy' *JHS*. 84: 92-106.

Lloyd, G.E.R. (1966) *Polarity and Analogy.* Cambridge.

Lloyd, G.E.R. (1970) *Early Greek Science: Thales to Aristotle.* London.

Lloyd, G.E.R. (1979) *Magic, Reason and Experience.* London.

Lloyd, G.E.R. (1983) *Science, Folklore and Ideology: studies in the life sciences in ancient Greece.* London.

Lloyd, G.E.R. (1987) *The Revolutions of Wisdom.* Berkley.

Lloyd, G.E.R. (1991) *Methods and Problems in Greek Science.* Cambridge.

Lloyd, G.E.R. (1996) *Aristotelian Explorations.* Cambridge.

Lloyd, G.E.R. (2007) 'Pneuma between body and soul.' *Journal of the Royal Anthropological Institute* 13: 135-46.

Longrigg, J. (1998) *Greek Medicine from the Heroic to the Hellenistic age: a sourcebook*. London.

Lonie, I.M. (1981) *The Hippocratic Treatises 'On Generation,' 'On the Nature of the Child,' 'Diseases IV': a commentary.* Berlin.

Lonie, I.M. (1983) 'Literacy and the development of Hippocratic medicine.' *Formes de penseé dans la Collection Hippocratique*,' edd. Lasserre, F. and Mundry, P. Geneva. 145-61.

Mann, J.E. (2012) *Hippocrates, on the Art of Medicine.* Leiden.

Mansfeld, J. (1971) *The Pseudo-Hippocratic Tract ΠΕΡΙ ΕΒΔΟΜΑΔΩΝ, Ch. 1-11 and Greek Philosophy.* Assen.

Mansfeld, J. (1983) 'The historical Hippocrates and the origins of scientific medicine.' *Nature Animated,* ed. Ruse, M. Dordrecht. 49-76.

McCoy, J. (2013) *Early Greek Philosophy.* Washington.

Morgan, K.A. (2000) *Myth and Philosophy from the Presocratics to Plato.* Cambridge.

Morizot, Y. (1994) 'Artemis, l'eau et la vie humaine' *L'eau, La Santé et La Maladie Dans Le Monde Grec: Actes du Colloque organisé à Paris.* edd.

Ginouvès, R. et al. *<<Archéologie et systems d'information>> et par l'URA 1255 <<Médecine grecque>>*. 201-13.

Nutton, V. (2013) *Ancient Medicine.* 2nded. Oxon.

Ogden, D. (2001) *Greek and Roman necromancy.* Princeton.

Padel, R. (1992) *In and Out of the Mind: Greek images of the tragic self.* Princeton.

Padel, R. (1995) *Whom the Gods Destroy.*

Page, D.L. (1953) 'Thucydides' description of the great plague.' 3.3/4: 97-119.

Pappas, N. and Zelcer, M. (2015) *Politics and Philosophy in Plato's* Menexenus. London and New York.

Parker, R. (1983) *Miasma: Pollution and purification in early Greek religion.* Oxford.

Parker, R. (2005) *Polytheism and Society at Athens.* Oxford.

Parker, R. (2011) *On Greek Religion.* Cornell.

Partenie, C. ed. (2009) *Plato's Myths.* Cambridge.

Potter, P. and Gundert, B. (2006) '*Hippocrates.*' Brill's New Pauly.

Preaux, C. (1973) *La Lune dans la Pensée Grecque.* Bruxelles.

Rigoglioso M. (2010) *Virgin Mother Goddesses of Antiquity.* Basingstoke.

Rihll, T. (1999) *Greek Science.* Oxford.

Roscher, W.H. (1911) *Die Hippokratische Schrift von der Siebenzahl.* Leipzig.

Sallares, R. (1991) *The Ecology of the Ancient Greek World.* London.

Salowey, C.A. (2002) ‘Herakles and Healing Cult in the Peloponnesos’ *Peloponnesian Sanctuaries and Cults.* Hägg, R. Stockholm. 171-177.

Sassi, M. (2001) *The Science of Man in Ancient Greece.* Chicago.

Schiefsky, M.J. (2005) *Hippocrates on Ancient Medicine.* Lieden.

Seaford, R. (2005) “Death and Wedding in Aeschylus’ Niobe” in McHardy, F., Robson, J. and Harvey, D. (eds) *Lost Dramas of Classical Athens: Greek tragic fragments,* Exeter, UK: University of Exeter Press, 113-127.

Segal, C. (1982) *Dionysiac poetics and Eurpides’* Bacchae. Princeton.

Singer, P. (1992) “Some Hippocratic Mind-Body Problems,” in López Férez, J. A. *Tratados hipocráticos : (estudios acerca de su contenido, forma e influencia): actas del VIIe Colloque international hippocratique (Madrid, 24-29 de septiembre de 1990),* 131-145.

Skydsgaard, J.E. (1988) ‘Transhumance in Ancient Greece,’ *Pastoral Economies in Classical Antiquity.* ed. Whittaker, C.R. Cambridge. 75-86.

Smith, W.D. (1979) *The Hippocratic tradition.* Cornell.

Solmsen, F. (1957) ‘Vital Heat, the inborn *pneuma* and the *aether.’ JHS* 77.1: 119-123.

Stewart, J. and Revett, N. (1762) *Antiquities of Athens.* London.

Taub, L. (2003) *Ancient Meteorology.* London.

Thivel, A. (2005) ‘Air, pneuma and breathing from Homer to Hippocrates.’ *Hippocrates in Context.* ed. van der Eijk, P. Brill. 239-251.

Thomas, R. (1992) *Literacy and Orality in Ancient Greece.* Cambridge.

Thomas, R. (2000) *Herodotus in Context.* Cambridge.

Thomas, O. (2015) 'Creating *Problemata* with the Hippocratic Corpus.' *The Aristotelian Problemata Physica* ed. Mayhew, R. Leiden. 79-100.

Thommen, L. (2012) *An Environmental History of Ancient Greece and Rome.* Hill, P. transl. Cambridge.

Villard (1992) 'Le bain dans la medecine Hippo

cratique' *L'eau, La Santé et La Maladie Dans Le Monde Grec: Actes du Colloque organisé à Paris (CNRS et Fondation Singer-Polignac) du 25 au 27 novembre 1992 par le Centre de recherché <<Archéologie et systems d'information>>* edd. Ginouvès, R. et al. *l'URA 1255 <<Médecine grecque>>*. 41-60.

Warren, J. (2007) *Presocratics.* Stocksfield.

West, M.L. (1971a) *Early Greek philosophy and the Orient.* Oxford.

West, M.L. (1971b) 'The Cosmology of Hippocrates: De Hebdomadibus.' *The Classical Quarterly* 21.2: 365-388.

Wright, M.R. (1981) *Empedocles: the extant fragments.* London.

Wright, M.R. (1995) *Cosmology in Antiquity.* London.